

# CACTUS AND SUCCULENT JOURNAL

VOL. XXIX

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No. 2



FIG. 22. May Bloss (Mrs. Peter W. Bloss), botanical artist, drawing *Adromischus tricolor* C. A. Smith, at the University of California Botanical Garden, Berkeley.



## CACTUS AND SUCCULENT JOURNAL

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Vol. XXIX

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## OUR COVER PICTURE

May Blos has drawn many of the cacti and other succulents illustrating the articles of P. C. Hutchison, which have appeared in this Journal, over 100 species to be treated in the Icones Plantarum Succulentarum series. The photograph is by Peter W. Blos.

## LESS SCIENTIFIC MATERIAL

This issue of the Journal contains 17 pages of scientific material and 21 pages for the amateur. Gladys Panis says, "regarding Mrs. Shields articles—wonderful! Can hardly wait to see the next Journal and from what I hear, all those who have read it are pleased too." We would suggest that in reading this installment of "Desert Flowers Under Glass" you should refer to the many additional illustrations in Brown's book "Succulents for the Amateur."

## LOPHOPHORA WILLIAMSII WANTED

Seeds or plants in varieties with pink, yellow, or white flowers for medicinal research. Dr. Gordon A. Alles, 770 S. Arroyo Parkway, Pasadena, Calif.

## PRINTERS' ERRORS

In Napanee, Ont., the weekly *Beaver* advised readers: "You may notice some typographical errors in this paper. They were put in intentionally. This paper tries to print something for everyone and some people are always looking for mistakes." This is not the reason that we transposed the captions on Figures 13 and 14 in the last Journal. Figure 13 should have read "entire plant" while Figure 14 should have read "stem apex." —SEH.

## CHICAGO CACTUS SOCIETY 1957 OFFICERS

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Officers elected January 20, 1957:  
President—Mr. L. R. Chambers  
Vice President—Mrs. Homer Bartling  
Secretary-Treasurer—Mrs. Conrad Eckstein  
(Opuntia Liz).

## FROM PENNSYLVANIA

In the summer of 1939 I bought a packet of mixed cactus seeds in England and planted them August 23rd in a pot at Bryn Athyn, Pa. The seeds soon sprouted but I had to wait till the summer of 1956 for my first blossoms. On August 16th, a plant of *Eriocereus guelichii* bloomed in the evening and on September 18th a plant of *Monvillea cavendishii* var. *saxicola* bloomed in the evening. Plants of *Cereus* species, *Monvillea smithiana* and *Opuntia robusta* from the same packet of seeds have not bloomed yet.

On page 15 of the Jan.-Feb. 1955 Cactus and Succulent Journal I make a statement that "one cluster of *Echinopsis* froze at the roots, but the upper parts were not frozen." After two winters with cacti in cold frames with temperatures falling to 0°F. and 10°F. outside and only about 10°F. warmer in the cold frames and studying the injured plants the following springs, I believe that what happened was, an infection by *Botrytis* turned the roots to mush before invading the tops. Cold seems to make cacti much more susceptible to *Botrytis*, and I lost a fine, large plant of *Rebutia senilis* and a number of plants of *Lobivia*, *Parodia* and *Echinopsis* to the same fungus after injury by low temperatures.

*Echinopsis multiplex* proved hardy and *E. turbinata* nearly as hardy. Some plants of the peanut cactus were injured and also some *Notocactus ottonis* plants. *Echinopsis calochlora* was tender to cold.

Some of the peanut cactus plants and the larger *Notocactus ottonis* plants were not injured. *Notocactus submammulosus*, *N. mammulosus* and *N. pampeanus* proved hardy except for some of the small plants.

*Notocactus scopae* also proved hardy. *Cleistocactus hyalacanthus* froze.

Slugs damage many of my cacti in the cold frames, I have tried both Snarol and chlorodane but have not observed any dead slugs after using either of them. I keep looking for them and crush them when found. Fungus and bacterial rots often follow slug injuries.

I still keep a record of the blooming dates of my cacti and succulents but have not yet summarized them for 1955 and 1956.

ARTHUR B. WELLS

P. O. Box 213, Bryn Athyn, Pa.

## ICONES PLANTARUM SUCCULENTARUM

### 7. *Adromischus blosianus* P. C. Hutchison<sup>1</sup>

By P. C. HUTCHISON

There seems to be no end to the amazing number of apparently narrowly endemic species occurring in the Richtersveld in Namaqualand, South Africa. Two plants of the species described here were received in 1954 from Mr. Harry Hall of the National Botanical Garden, Kirstenbosch, South Africa, under the N.B.G. number 723/53. Both flowered in 1955 and again in 1956. Hall collected them at Holgat, midway between Port Nolloth and Alexander Bay. In his notes he remarks that this species "grows under bush and in shallow rock crevices at Holgat. Holgat, or the Holgat River, is a river bed, probably rarely seen with water in it, that comes from the Richtersveld, and because there are rocky ledges on its banks, all manner of succulents get some measure of anchorage. A few yards from the brink of the ravine there is the limitless sand where small succulents would get swallowed up. [It is] associated with *Crassula arta*, a very small form of *Crassula columnaris* which forms reddish carpets along the shallow rock pans, *Huernia namaquensis* in enormous numbers and other *Crassulas*."

*Adromischus blosianus* P. C. Hutchison, sp. nov. Radices tuberosae; caules 1-2 cm. longi; folia breviter petiolata, obovata, symmetrica, acuta, longiora quam latiora, usque ad 3.5 cm. longa et 2.5 cm. lata, 1.5 cm. crassa vel crassiora, utrinque convexa, griseo-viridia et pallide rubescenti-purpureo-tincta, non maculata, in margine atropurpurea apicali incrassata et crispato-undulata; inflorescentiae simplices, usque ad 25 cm. longo, pedunculo griseo-purpureo, floribus in spira singuli laxa dispositis, pedicellis griseo-albis, 7 mm. longis; perianthii tubus 14 mm. longus, fauce luteo-papillosus; limbi lobi recurvati, oblongo-ovati, acuti, 3 mm. longi, 1.5 mm. lati, pallide rubescenti-purpurei marginibus atropurpureis; antherae luteo-aurantiacae, maculatae, maculis numerosis rubris in sulcis et apice dispositis.

Roots tuberous. Stem 1 to 2 cm. long, up to 1 cm. in diam., gray or gray-green, almost smooth. Leaves subopposite, forming a tight rosette, horizontal to erect, shortly petiolate, symmetrical, obovate, acute, usually longer than broad, up to 3.5 cm. long and 2.5 cm. broad, 15 mm. thick or more, convex on both faces, the

upper face often less convex, gray-green tinged pale reddish purple, unspotted, margined on the upper half, terete below, the margin thickened, crispate-undulate, blackish red, the cross-sections of leaves at any point oval. Inflorescence simple, up to ca. 25 cm. long, the base up to 2 mm. thick, gray-purple, the lower 10 cm. with ca. 10 thick, blunt to acute, ovate-deltoid to deltoid reddish tipped sterile bracts 1.5 mm. long, 1 mm. broad and 0.5 mm. thick; rachis 10 to 12 cm. long; flowers 10 or more, erect, single, arranged in a single very loose spiral. Pedicels gray-white, up to 7 mm. long, ca. 2 mm. thick, narrowed below, barely broader apically. Calyx lobes deltoid-acute, a little less than 2 mm. wide and long. Perianth tube glaucous-green tinged purplish near base on the outside, bright pale green inside, 14 mm. long, 4 mm. in diam. at base, narrowed to 3 mm. above, the cross-section at mid-point somewhat pentagonal with rounded corners and only barely indented at the sinuses, these extending as conspicuous indentations of the tube to ca. 7 mm. from the apex, inconspicuous below there, the tube-throat conspicuously and densely papillose, the papillae yellow, translucent; limb lobes spreading, then recurved, oblong-ovate, acute to acuminate, 3 mm. long, 1.5 mm. broad, pale reddish purple with very dark margins, the bases papillose, the papillae yellow and translucent. Stamen filaments biseriate at about mid-tube, green or yellow-green, the upper series 6 to 7 mm. long, the lower series half as long; anthers included, oblong, 2 mm. long, yellow-orange with many red spots arranged longitudinally along the grooves and at the apex below the terminal translucent globule, the spots in solid masses in the two indehiscent grooves, diffuse elsewhere. Carpels ca. 10 mm. long, green, wrinkled, the styles subulate, pale yellowish green, the stigmas indistinct. Nectary scales ca. 1 mm. long and 1.5 mm. broad, emarginate, yellowish.

South Africa, Namaqualand, Richtersveld, Holgat, midway between Port Nolloth and Alexander Bay, leg. H. Hall [N.B.G. 723/53], University of California Botanical Garden 54.111-1 (BOL-Holotype).

54.111-1 and a second plant of the same collection are in cultivation here. Additional herbarium material will be made from both plants and filed at K, PRE, UC and US.

<sup>1</sup>University of California Botanical Garden Contribution Number 144.



FIG. 23  
*Adromischus blosianus* Hutchis., the clonotype,  
U.C.B.G. 54.111-1, about 0.7 x.

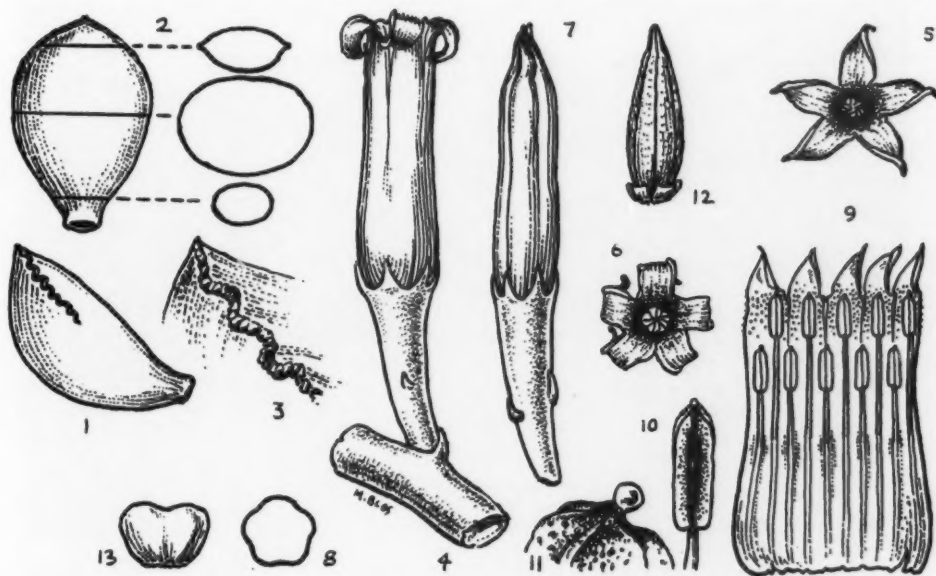


FIG. 24

*Adromischus blosianus* Hutchis., the clonotype, U.C.B.G. 54.111-1. 1. Leaf, side view. 2. Leaf, top view and cross-sections. 3. Detail, apical leaf margin. 4. Flower. 5. Perianth limb, expanded. 6. Perianth limb, recurved. 7. Bud. 8. Cross-section perianth tube at midpoint. 9. Stamen insertion. 10. Anther. 11. Anther apex. 12. Carpels. 13. Nectary scale. 1-2, natural size. 4-9, 13, x 3. 10, 13, x 9. 3, 11, greatly enlarged. Drawing by Mrs. M. Bos.

This new species is nearest in morphology to *Adromischus ballii* Hutchis., from which it differs in the shape and color of its leaves, the color of the flower, the color of the papillae on the perianth limb bases and tube-throat, the much shorter lower and longer upper series of filaments, and the color, shape and spotting of the anthers. The flowers are less glaucous as is the entire plant, and the perianth tube is less constricted. Perhaps the most striking characteristic of *A. blosianus*, however, is the arrangement of the flowers in a single, gentle spiral on the rachis. In most *Adromischus* species the flowers are arranged in many spirals about the rachis.

The specific name commemorates the extensive collaboration of May Bos (Mrs. Peter W. Bos) of Oakland, California, who has for sev-

eral years prepared many of the drawings which have been published by me with articles on various groups of succulent plants. Of approximately 200 such drawings at least 50 are of species of the genus *Adromischus*. Mrs. Bos' drawings of botanical and zoological subjects have been widely published in a variety of scientific works.

*Adromischus blosianus* is an attractive plant the year around by reason of its dwarf habit, its compact, colorful foliage, and its graceful inflorescences, and it should be widely grown. Unlike several of the other dwarf species, it is a fast grower and seems to adapt to a variety of cultural conditions. It will probably prove useful both in bowl plantings or in the rock garden, especially where strong light and good drainage are available.





FIG. 25. The "Beautiful Shelf"

## DESERT FLOWERS UNDER GLASS

*The story of my experiences and delight in growing and flowering Cacti and Succulents in a small glasshouse in Christchurch, New Zealand*

By MARJORIE E. SHIELDS

### PART II—ECHEVERIAS

Here is the open doorway, welcoming all who pass this way. So won't you come in? And as we slowly wend our way around my glasshouse, we can stop to admire a plant here, a group there, a lovely flower perhaps, or to discuss the various specimens as we come to them. I can tell you, if you are interested, where they come from; at what time of the year they flower; what their names mean; how to treat them to keep them looking at their best; and what pests or diseases attack them. You will come? Good! The ventilators and the door are all open wide, so it will not be unduly hot.

First, just inside the door, are the colourful Echeverias. These plants were named after a botanical illustrator, Atanasio Echeverria. They are found in southern North America and northern South America, and are perhaps the most beautiful of all succulents. The leaves are usually arranged in rosettes of various shapes and sizes.

Do you notice how they appear to be divided into two types? Plants in the group with wax covered leaves, powdered with meal, generally have beautiful opalescent colouring, with flower stem and calyx matching the leaves and the flowers in very soft pastel shades. The other group has hairy leaves, or leaves covered with down. Most of these plants are greener, although the hairy surface sometimes considerably alters the colouring. The flowering stems and calyxes are also green and hairy to match the leaves, with flowers usually much brighter in colour than the waxy ones. The wax and the hair are not there for the plant's adornment, but are Nature's way of providing protection from the hot sun, and the hotter the sun, the thicker will be the wax or the hair.

A fairly rich, porous soil, is needed, and, as the plants are surface rooting, I am going to experiment this summer by mulching with pulverised sheep manure. This should not only help



FIG. 26. (Top row) *Echeveria fulgens*. (Middle row) *E. gibbiflora*. (Bottom row) *E. livida*

to keep the surface roots cool but should be of considerable food benefit. Some *Echeverias* can be propagated readily by leaves from the rosette, others from leaves from the flowering stems. Cuttings will nearly always strike. Some can be propagated only by planting the spent flowering stem. These are the most difficult, because experience alone can tell the exact time when these flowering stems should be cut. *Echeverias* commence flowering in July—the last and coldest month of winter.\* They are the promise of spring, of lovely days, and lovelier flowers ahead. There is scarcely a month throughout the year when there are no flowers at all to be seen. Some bloom only once but others blossom periodically throughout the whole year. Beginning with the July flowering ones we shall continue with the others through the seasons.

*E. fulgens* from Mexico, meaning glittering-shining, is one of these heralds of spring. It has long flower stalks reaching to the roof, with a lovely head of flowers. The top of the stem has broken into many short branches each adorned with six to eight palish orange flowers almost as wide as they are long. Little branchlets hold them away from the main stem in a most attractive way. Its beautiful rosette is like alabaster, with the same soft sheen. Each leaf, with edges daintily crimped, is delicately tinted with green, pink and mauve blending into each other. Lovely, soft dawn colourings. *E. gibbiflora* hybrid next to it has a purplish red rosette with pale pink translucent leaf edges, which are not crimped like *E. fulgens*, but the flower is similar though of a different colour. The hybrid is almost red on the outside and deep orange inside. It is a very colourful plant. The flower is displayed in the same manner, which leads one to surmise *E. fulgens* had some part in its parentage. *E. gibbiflora* by its side has a large more compact head of paler flowers, with the blooms packed tighter together and more closely to the main stem. "*Gibbiflora*" means—with flowers swollen on one side. The variety *carunculata* which means—"having small excrescences," refers to those fantastic raised blisters on the leaves of the purple blue rosette. This plant has not yet reached flowering size. All the *gibbifloras* come from Mexico.

The next one's name *E. crenulata* explains itself. The large rosette is cup shaped, lime green flushed with pink and with crenulated edges. Very beautiful! The flower is colourful too, with the calyx as brightly tinted red as the flower itself. An entirely different one is *E. pubescens*—meaning "downy." This also has a long flower stalk on which the flowers are placed tightly, with no individual branchlets. However these long, bright green stems look very gay adorned

with vivid orange flowers, each surrounded by a green frill for a calyx, accentuating the colour of the flowers. *E. pubescens* var. *recurva* has an identical flower. Don't you think this plant could be a monstrose form of *E. pubescens*? Sometimes it reverts almost back to normal. Both these plants have very small rosettes which elongate and disappear altogether as the flowering stem grows.

The large green rosette, with the long narrow, sharply pointed leaves is unfortunately an unnamed species. Maybe it is an *Urbinia* hybrid. The bright red and orange flowers are displayed on long very much branched flower stems, reminiscent of an *Urbinia*, and the leaves are a delightful green flushed with copper and with pink luminous edges, each leaf ending in a sharp pink spike. It puts on many displays of its most attractive flowers throughout the year. Two others belonging to this month are *E. carnicolor* and *E. lurida*. Both very charming little plants. Here they are right near the front of the bench. *E. carnicolor* hails from Mexico, its name means flesh coloured, and it has lovely little flesh coloured rosettes with a metallic tinge and sparkles with a crystalline sheen. The small bright red flowers are on the end of a very thin stem and they seem to nod as we pass by. *E. lurida* is an indescribable plum red colour, covered with wax, making it look almost metallic. "*Lurida*" means sallow or pale yellow. This must surely refer to the flower stem, which is long, compared with the size of the plant and pale yellow adorned at the top with coral bells.

That colourful one with the velvety leaves is *E. pulvinata* and it ushers in the spring or August group. Isn't it a gorgeous plant with its leaves covered with tiny white hairs, making them look like many little green velvet cushions covered with a silver sheen. The name means a cushion. See how the edges of the leaves have been dipped in red? The flowers borne on cinnamon-brown stems, are deep orange with a bright red mid rib ending in a red tip. They are quite large for an *Echeveria*. This plant is one of the showiest of the family. Here beside it is another hairy one, *E. pilosa*, which means hairy, with soft slender hairs, which describes this plant perfectly, for its leaves are covered with tiny hairs, giving it a frosty appearance, and at this time of the year each leaf is red tipped. The flowers are not quite as large nor as brilliant as those of *E. pulvinata*. This little one in front is *E. derenbergii*, also from Mexico. Isn't it a little gem? The small tightly closed rosettes are really waxy looking, pale blue gray in colour, with each leaf tip coming to a tiny sharp point. The nearly orange flowers are on a short stem. They do not hang their heads as is the habit of most *Echeverias*, but hold

\*Remember the seasons in New Zealand are opposite those of the northern hemisphere.



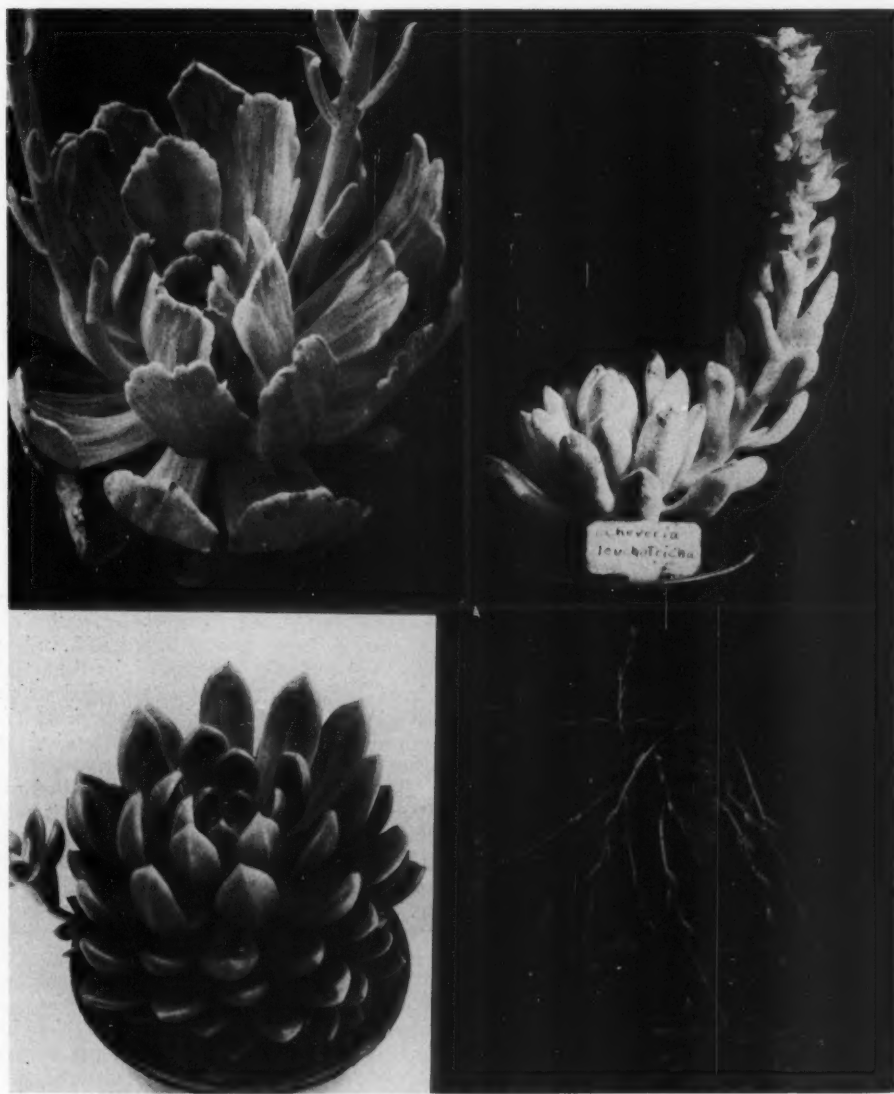


FIG. 27. (Upper left) *Echeveria boveyi*. (Upper right) *E. leucotricha*. (Bottom left) *E. scaphophylla*. (Bottom right) *E. set-oliver*, when grown in the open the stems are upright.

them high, so that all who pass by may see their loveliness. Here is another that does not hide its beauty, *E. retusa*. This one has loose rosettes; the waxy leaves are longish and narrow, widening at the top, where there is a small notch—"retuse" means rounded at the top and shallowly notched. They are very blue in colour, with wavy pinkish-purple edges. It also has a short flower stem with orange flowers; and if you look closely you will see that each petal is well peppered with tiny red spots at the tip.

The hanging basket contains *E. multicaulis*; a quite different type of *Echeveria*. Each rosette is composed of small leaves, wider than they are long, making a very flat rosette, which at this time of the year turns a beautiful red, instead of being the usual dark green. The plant is much branched, each branch terminating in a rosette. Being so red they look almost like flowers themselves, but the true flowers are orange with a red mid-rib. *Echeveria* "Manda's Hybrid" is different again. This is another red looking plant. The

rosettes are very loose, the leaves being long and narrow, and the flower stems long and straggly. It takes up a lot of room on the bench and would probably be better in a hanging basket when in flower. The leaves are rough to the touch, dark green when young and turning grass green with age shading to rusty red on the outside edges. The light orange flowers along the stems are of medium size. One of the loveliest of the wavy variety is *E. orpetii*. The beautiful, almost perfect rosette has opalescent colouring, rather difficult to describe. The apricot flowers on the very long stems have short wide petals held in place by the lovely squat, opal calyx. A colour combination to dream about.

September's warmer weather ushers in *E. leucotricha*. The name means "white haired," and see how the stems, leaves and calyx are covered with soft, white, silky hairs, which lie down flat. The hair on *E. pulvinata* and *E. pilosa* stands up straight, showing the green through; but on *E. leucotricha* there is no green to be seen anywhere; it is white all over, except for the cinnamon brown on the hairy stems and 'round the edges of the leaves. It is a very beautiful plant with lovely coral flowers peeping out from their furry white bonnets. This one is *E. elegans* in a gramophone record for a pot. If records are heated in the oven until soft and pliable, they can be moulded into quite good pans for plants that like to spread themselves or throw out offshoots all 'round them as do some of the Echeverias. They are good also for Haworthias, but useless as hanging baskets, for the sun softens them and the weight pulls them out of shape. This pan of *E. elegans* looks as though it is full of balls of ice, pink on the top where the sun catches them. The pink flower stem is 6 to 8 inches long, with smallish flowers in a deeper shade, tipped with yellow. A well grown plant of *E. elegans* always commands attention. In this other pan is *E. microcalyx*, with its small open rosettes in teal flushed with rose-pink, and the tiny stems carry aloft little deep pink to red flowers. *E. amoena*\* is somewhat similar, but the rosettes are smaller with slightly wider colourful leaves flushed with salmon pink deepening into red. The tiny red flowers have but a 4-inch stem. I think these two have the smallest flowers of all Echeverias. One not much larger is *E. expatriata*. The teal rosette tinted on the tips with pink is exquisite, and I think the most beautiful of them all. The tiny flowers are borne on stems produced horizontally from both sides of the plant.

*E. gilva* opens in October with flowers almost identical to *E. elegans*. These are not spectacular, just small, colourful, and pretty, but during the

winter both plants are very beautiful, and in complete contrast. *E. gilva* colours until it looks like a bowl of red roses, but *E. elegans* closes its rosettes into icy looking balls. Here is *E. simulans* with a very blue wide open waxy rosette. It is very like *E. elegans*, being about the same size and with a similar flower, perhaps that is why it is called "simulans"! But the leaves are not incurved at all, this one never folds itself up into a ball.

The weather is getting very warm now, and November will see *E. setosa* in all its glory. This is a very gay, attractive plant. Like many of the others it comes from Mexico. Its popular name is the "fire cracker," a very apt description, for the tiny flowers are so red and have such bright yellow tips, it takes little imagination to liken them to a fire cracker. The plant itself is charming with its many narrow, very hairy leaves. "Setosa" means bristly, a true description of this plant, for it is bristly but the bristles are soft. The flowers too are held in bristly green cups. This one with the lovely soft colouring is *Pachyveria scheideckeri*, a cross between *E. secunda* and *Pachyphytum bracteosum*, no wonder it is so beautiful! The teal rosettes are flushed with pink and the bright red flowers tipped with yellow look most attractive surrounded by their teal calyces. I can never make up my mind which colouring is the most beautiful, this, or *E. orpetii*. Both are plants that must not be touched as finger marks mar their perfect beauty.

The tall, dark green, perfectly modelled rosette is *E. scaphophylla*. I have flowered it only once, even though I have had it for some years. Each time a flower head appeared it became very badly infected with black aphids and it had to be picked off and burned. The flower stem is very weak and grows about 18 inches long, trailing across the bench. The flowers are nondescript pale cream. In its effort to flower the plant lost its beautiful symmetrical shape and the rosette became ragged looking. It gained nothing by blooming so flowering stems are now removed as they appear.

Nature, like us, pays homage to the Birthday of our Lord in December. In the northern hemisphere the trees deck themselves with berries, and in the southern hemisphere beautiful lilies are Nature's gift. In my glasshouse *E. harmsii*, or to give it its old name *Oliveranthus elegans*—which I much prefer, always decorated its branches for the Christmas festival, by lighting its beautiful red lanterns.\* The tips of the petals turn back to show the lovely yellow lining. The ovary, which is quite large, and situated in the centre of the lantern, is red, and acts as the

\*The leaves become easily detached and root where they fall.

\*Flowers in northern hemisphere in early summer and is one of the most beautiful plants in Crassulaceae.

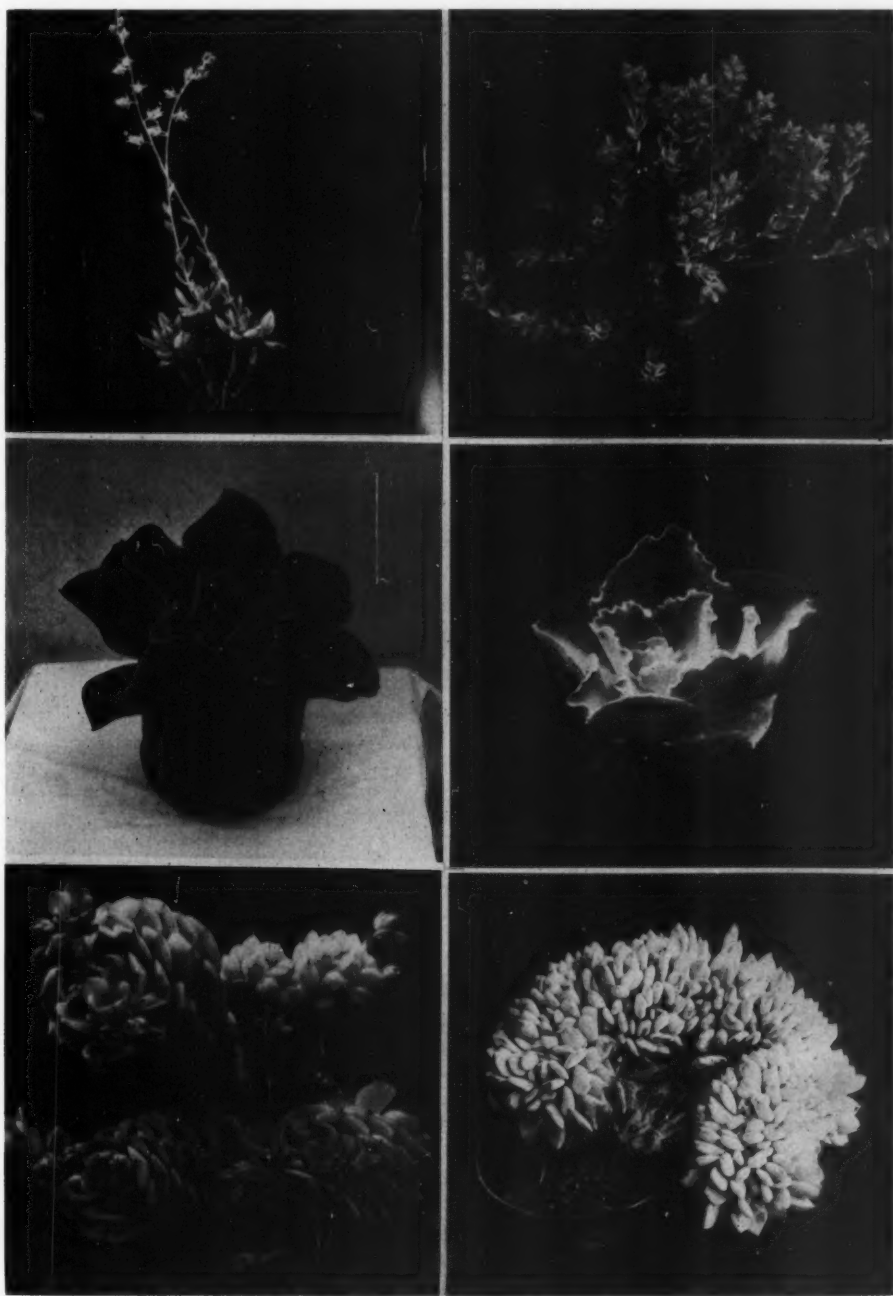


FIG. 28. (Top left) *Echeveria nodulosa*. (Top right) *E. pulvinata*. (Center left) *E. hybrid*. (Center right) *E. crenulata*. (Bottom left) *E. derenbergii*. (Bottom right) crest of *Pachyveria scheideckerii*

light which shines through. Each lantern is 1½ inches long by ½ inch wide, and a plant in full flower is a glorious sight. The plant without the flowers is quite pretty, the leaves being grass green edged with red, the centre vein is often coloured too. This plant does not like excessive heat, and if the summer is very hot, it has to retire to the bed under the bench.

Here is another with big flowers, but these are not nearly as large nor as gay as those on *Oliveranthus elegans*. As its name is *E. set-oliver* it sounds as though it could be a close relation doesn't it? Actually it is. *Oliveranthus* was one of its parents and *E. setosa* the other, and as you see it has characteristics of both. Let us place them side by side for better comparison. There, you see, it has the hairy leaves and somewhat the same type of rosette as *E. setosa*, (but it is not nearly as large nor is the hair as long or thick). The red, around the edges comes from *Oliveranthus*. There are still a few flowers left on *E. setosa* but they are nothing like those of *E. set-oliver*. We will have to look to *Oliveranthus* for the flower, which you see has the same type, and, as I said before, not nearly as spectacular, being smaller, narrower and paler in colour, not like a lantern at all. If we had not seen *Oliveranthus* we should have thought *E. setosa* a grand *Echeveria*, but *Oliveranthus* overshadows it.

Here are three large rosettes with wax instead of hair for protection. Each is beautiful in its own way. *E. kewensis* is more blue than green and being covered with powder is very delicate in its colouring, especially as the edges of its leaves are outlined in pale pink, each one coming to a brighter pink point. The flower stem is also pink, flushed with purple and branches into two, horizontally, the better to display its pinkish-red flowers tipped with yellow. *E. hybrida* has similar colouring, but the rosette is differently shaped, having the appearance of being flat on top. Each leaf is turned in and waved on both sides forming a flattish scoop. It is incredibly beautiful both in shape and colour, looking as though modelled in wax. The flowers are practically the same as those of *E. kewensis*. The third is *E. aggregata* with much brighter colouring, being greener and brushed with such a bright pink as to be almost red. The leaves of this plant are attractively shaped too, but are not so perfectly formed as are those of *E. hybrida*. The flowers are deep apricot, lined with orange. See that cristate hanging on the archway? This plant was a cutting taken from it—a piece that had reverted to normal. It is hard to credit isn't it? "Aggregata" means clustered, but mine has never done so. You will notice there are several other cristates here, but I am not particularly fond of cristate *Echeverias*, as they are hard to

keep clean and are very susceptible to scale.

*E. nodulosa*, meaning "knotty or having nodules," is as pale and delicate looking as *E. aggregata* is colourful and robust. It is not delicate, but just has lovely pale colouring—a blond, whereas the other is a brunette. The leaves are in small loose rosettes of dark bluish green with maroon markings down the centre and 'round the edges of each leaf. The plant looks like a little branched shrub. The flowers are pale salmon, almost flesh, shading to deep cream, lovely soft colouring, blending so marvelously with the leaf shades.

The shape of the leaves and the rosettes of the hybrid *Pachyveria la rochette* are lovely. The whole plant including the stems and calyces are opalescent in colouring with a pink sheen. I have had this plant for many years and it has flowered only once. Maybe if it flowers again the blooms will be better.

Here is colourful *E. boveyi* which flowers in the very hottest part of the year—January. How can it be described? It is an exquisite piece of workmanship. No two leaves in the rosette are alike either in colouring or in shape, except that they are all narrow with ragged tips. These tips are cut, indented, rounded or toothed; some wide, some narrow. The plant seems to have set itself out to see how varied it could be. Each leaf is differently coloured too. The basic shading is soft, pale, bluish green. Then it seems as though before this colour was dry, darker green was poured on, followed by mauve, pink and cream, all running down the leaf in blended stripes. The effect is beautiful. The small pinkish orange flower is of secondary consideration only, as the lovely rosette is a flower in itself. No two of these plants are alike, some being more green than pink, others again pink and cream with scarcely any green in them at all.

Because there are no more plants to discuss that does not mean the group will be flowerless. Far from it. Many will continue blooming until the end of summer, but as the season advances, so do the plants alter. After flowering many of them lose their beauty and look a little tired, but with the cooler weather of autumn the plants take on a new attractiveness and once more become perfect specimens with delightful colourings freshly coated with meal, and next year's flowering stems begin to develop.

Even though *Echeverias* are evergreens they do lose their leaves and as these dry they should be gathered. Otherwise they fall and make the bench untidy and harbour mealie bugs. When many leaves have been lost and plants begin to look leggy, the stems may be cut off three or four inches below the rosette and either rerooted in vermiculite or else placed in an inverted flower pot, when new roots will soon develop. These



FIG. 29 (Upper left) *Echeveria orpetii*. (Right) *Pachyveria la rochette*. (Bottom) *Echeveria pilosa* of the University of California, Berkeley, nat. size. Photo by P. C. Hutchison, 1955.

new plants can then be repotted. Watch for mealy bugs also for white wax scale which sometimes develops on the undersides of rosettes. Remove spent flower heads as these may be attacked by black aphids. Echeverias like plenty of fresh air, so I placed them near the door which is kept

wide open day and night, except in winter and early spring when frosts are likely. My plants are very seldom attacked by pests, maybe that is why. I think that covers everything so let us move on now to the next group: *Oreocereus*, *Echinofossulocactus*, and *Astrophytum*.



## ICONES PLANTARUM SUCCULENTARUM

### 8. *Borzicactus aurantiacus* (Vaupel) Kimnach et Hutchison<sup>1</sup>

By MYRON KIMNACH AND P. C. HUTCHISON

In 1953 the Botanical Garden of the University of California, Berkeley, received an "*Oroya* species nova" reputedly native to Peru. While it had some vegetative resemblance to *Oroya peruviana* (Schum.) Britt. & Rose, its flowers were said to be long and zygomorphic, in contrast to those of *Oroya* which are short and regular. Our plant soon flowered and was found to be *Echinocactus aurantiacus* Vaupel, a little-known species with orange-red, zygomorphic flowers discovered over 50 years ago but until recently unknown in cultivation. Besides having horticultural value, this species has a morphology which is useful in interpreting the phylogeny of *Borzicactus* Ricc. and its allies, therefore it is discussed here in detail.

*Echinocactus aurantiacus* was described in 1913<sup>2</sup>, nine years after its discovery by Weberbauer at San Pablo in the Department of Cajamarca, Peru. Vaupel commented that it was related to *Echinocactus peruvianus* Schum., which, however, had distinctly shorter flowers and different spination.

Britton and Rose<sup>3</sup> placed the species in the tribe *Cereeae*, subtribe *Echinocactanae* and at the end of their treatment of *Oroya*, listing it under "Described species, perhaps of this genus," but they did not transfer it from *Echinocactus*. They gave a short summary of Vaupel's description, but misspelled the type locality as "Catamarca."

Backeberg<sup>4</sup> tentatively associated it with *Matucana* Britt. & Rose, but did not transfer it. The flowers of *E. aurantiacus* are, indeed, more similar to those of *Matucana* than they are to those of *Oroya*, but they contain copious wool in the bracteole axils, whereas in *Matucana* these axils supposedly lack wool. In neither genus, then, as they were originally defined, would this species have seemed well-placed.

In 1939 Werdermann<sup>5</sup> examined the holotype at Berlin-Dahlem and interpreted the flowers as being somewhat zygomorphic. Because of this

zygomorphy, the sub-globose stems, and the presence of hairs on the flower tube, he transferred the species to *Arequipa* Britt. & Rose. Oehme<sup>6</sup> accepted this transfer in his treatment of *Arequipa* but subsequent authors have either not mentioned the species or have repeated earlier views. Up to this time no one had examined living material.

In 1940 this species was collected in Peru by Harry Blossfeld, now resident in Brazil. To our inquiry for information he wrote in 1955 as follows: "I was in Huancabamba in northern Peru and tried by horseback to reach the Marañon river near Jaen. However, I had to give up after one and a half days because the drought had been so severe that year that no food could be obtained for our mules. The southernmost place I reached was the small village of Sonder, which is west of the Marañon. I remember having collected a globular cactus near there, and I took down a field note because globular cacti are scarce in that region. Excluding *Melocactus*, I have not seen any north of the Huaras mountain system. This note refers to my number 96 and states that the flowers are orange, large, the body with long brown spines. I am sure I did not see this plant at Huancabamba, or anywhere else."

He sent two of the plants collected near Sonder to the Huntington Botanical Gardens, San Marino, California, but William Hertrich writes us that these were either dead on arrival or died soon after. In 1941 Blossfeld sent 2 specimens to Herman Marks of Salinas, California, who planted them in his outdoor cactus rockery where they eventually flowered and produced seed. By 1951 all the plants were dead, but seed was given to Robert Flores, of Salinas, who raised about two dozen seedlings. Some of these were grafted on outdoor plants of *Trichocereus spachianus* on which they grew rapidly, acquiring a denser covering of spines than plants on their own roots. In 1953 we received one of these grafted plants, which, after growing for three years in our outdoor cactus garden, shows a shorter and more open spination and a greater basal proliferation than do the plants in Flores' garden. The description below is based primarily on this living material.

After examining flowers, fruit and seed of this material, in conjunction with a study of the genus *Borzicactus* now being undertaken here, we have decided to transfer *Echinocactus auran-*

<sup>1</sup>University of California Botanical Garden, Berkeley, Contribution Number 145.

<sup>2</sup>Vaupel, F., Bot. Jahrb. 50, Beibl. 111: 23, 1913.

<sup>3</sup>Britton, N. L. and J. N. Rose, Cactaceae 3: 102, 1922.

<sup>4</sup>Backeberg, C., in Backeberg and Knuth, Kaktus-ABC, 199, 1935.

<sup>5</sup>Werdermann, E., Kakteenk. 5: 77, 1939.

<sup>6</sup>Oehme, H., Cactaceae, Jahrb. Deutsch. Kakt.-Ges. 1940: 6-11, 1940.

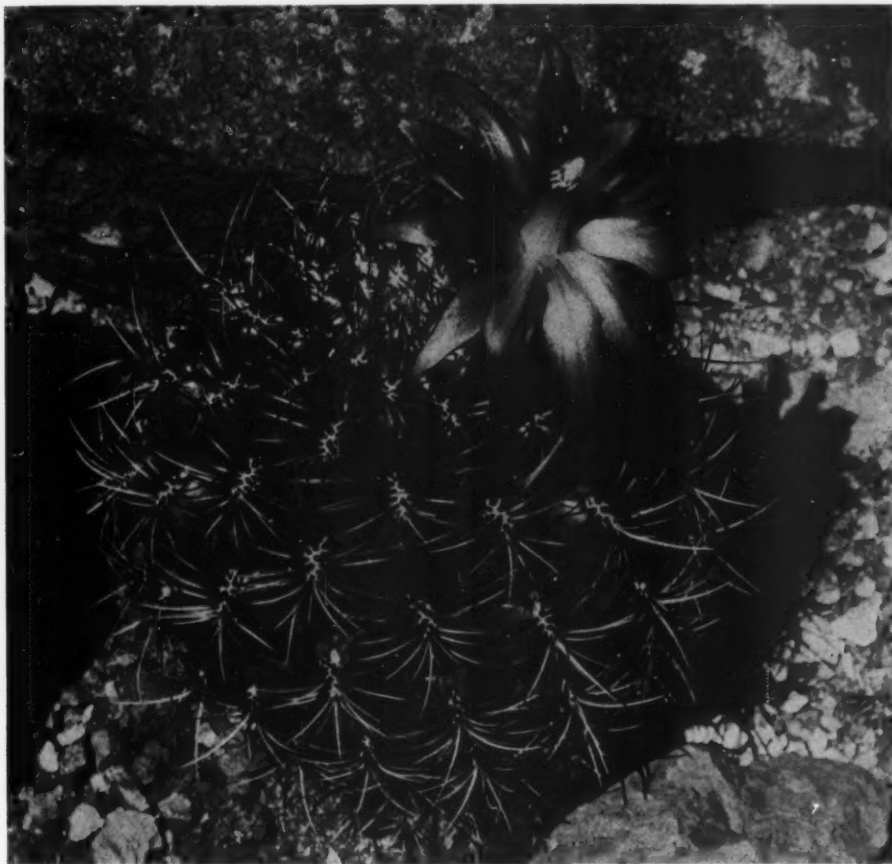


FIG. 30

*Borzicactus aurantiacus* (Vaupel) Kimn. & Hutchis., U. C. B. G. 53.486, growing in the cactus garden of the University of California, Berkeley, nat. size. Photo by P. C. Hutchison, 1955.

*tiacus* to *Borzicactus*. In the Britton and Rose system *Borzicactus* is in a different subtribe (*Cereadae*) from *Arequipa*, hence a brief survey of concepts of relationship of *Borzicactus* and its allies is given after the following description.

*Borzicactus aurantiacus* (Vaupel) Kimnach et Hutchison, *comb. nov.*

*Echinocactus aurantiacus* Vaupel, Bot. Jahrb. 50, Beibl. 111: 23, 1913.

*Arequipa aurantiaca* Werdermann, Kakteenk. 5: 77, 1939.

*Plant* caespitose; *stems* globular, up to 15 cm. high and wide, the epidermis dark green, shiny; *ribs* slightly spiralled, completely divided into *podaria*, these up to 3 cm. in diameter, octagonal but with the upper center angle directed downward and connected to the areole by a groove 5 mm. long, evenly convex, highest at the areole,

with a 2 mm. long, deltoid-acuminate protuberance 2 mm. below the areole, this protuberance most prominent on young *podaria*; *areoles* borne above the center of the *podaria*, elliptic, 1.5 cm. long, 4 to 7 mm. wide, the short wool yellowish white, later gray; *spines* 20 to 30, the radials and centrals intergrading, the radials (0.3) 2 to 2.5 cm. long, subpectinate, their apices recurved, the uppermost 3 or 4 straight and suberect, the centrals 3 to 7, 2.5 to 4.5 cm. long, one slightly exceeding the others, the uppermost erect, the remainder subhorizontal, all the spines stiff, dark castaneous on lower half and yellowish near apex when young, finally entirely brownish gray.

*Flowers* borne on the upper third of the plant, radially distributed, arising from the upper end of the areole but not from the groove, all usually facing southward, 7 to 9 cm. long, tubular-funnelform with a zygomorphic limb 5 to 7 cm.

wide; *pericarpel* indistinct, *ca.* 1 cm. long; entire *receptacle* slightly curved, terete, 5 to 5.5 cm. long, 12 to 17 mm. wide, widest just below midpoint, brownish purple (Garnet Brown)<sup>7</sup> or greenish near the base except for the brownish pink bracteoles, shading above into orange and red (Vermilion to Signal Red); *bracteoles* deltoid to linear-lanceolate, 2 to 15 mm. long, up to 4 mm. wide, spirally arranged, light to dark brownish rose (Delft Rose), often grading to orange at the base, the podaria long-decurrent, only the lower ones confluent, dark pink to orange-pink; subtended *hairs* 40 to 50, 3 to 7 mm. long, dark brown with the apex light brown to cream, the hidden bases yellow; bracteoles grading to 20 *tepals*, the outer ones linear-lanceolate, up to 2.5 cm. long and 7 mm. wide, strongly recurved, orange-yellow at the base and along the center, shading at the edges and ends into dark red (Vermilion to Signal Red), the inner ones obovate-oblong, apiculate, 2.5 to 3 cm. long, up to 1 cm. wide, with an obscure yellowish central keel, *ca.* two of the abaxial ones erect, appressed to stamens, their tips recurved, the adjacent segments suberect, the remainder spreading, all colored like outer ones but purplish at margins; *ovule-chamber* turbinate to oblate, 2 to 4 mm. long, 5 to 7 mm. wide, the funicles branched, with long papillae on inner side of curve; *nectary-chamber* irregularly oblate, 2 to 3 mm. long, 4 to 5 mm. wide, the central 2 mm. filled by the style base, containing nearly odorless nectar from the protuberant pale yellow staminal nectaries lining the chamber-wall; primary *stamens* inserted at top of chamber and there coalescent, thickened, bent at right angles to receptacle, forming a diaphragm which closes the chamber and evenly surrounds and touches the style, the filaments then erect and remaining coalescent to form a tube 2 mm. long surrounding the style, then free for 5 cm., or usually some (up to 9) of the innermost series free for only 1 mm. and terminating in a cluster of 2 to 12 curly, yellowish hairs up to 3 mm. long, the filaments of the secondary stamens spirally inserted along the white inner face of the receptacle, sparse in the mid-portion, an occasional one from the diaphragm, the upper two whorls forming a throat-circle with the filaments weakly coalescent for *ca.* 5 mm. beyond the receptacle, all stamens exerted, forming a compact cylindrical column surrounding the stigma, white below, the exposed portions pink; anthers light yellow, *ca.* 3 mm. long; *style* 5 to 8 cm. long, 1.5 mm. thick, cream below, tan-pink above, the stigma-lobes 7 to 9, 3 to 8 mm. long, partly expanded, heavily papillose on all surfaces, yellow-green.

*Fruit* oblate to subglobose, 1.5 to 2 cm. in diameter, dark brown or purplish red when unripe, finally yellowish red, the bracteoles *ca.* 5 mm. apart, deltoid-lanceolate, acute, 2 to 5 mm. long, brownish red, appressed, containing in their axils white hairs 1 to 2 mm. long, the pericarp strongly and irregularly ribbed or furrowed, the ribs prominent, obtuse, up to 5 mm. wide and 2 mm. high, the perianth withering-persistent; *dehiscence* by longitudinal fissures between the ribs, sometimes with a long single fissure, or usually with shorter ones between some or all ribs, the fissures becoming twisted and expanded exposing scanty, dry pulp, some of the seeds persisting for a longer time on the fruit wall by their funicles.

*Seeds* galeate, *ca.* 1.5 mm. in diameter, the testa dull, brownish black or black, tuberculate, the tubercles often confluent, smaller and brownish near the hilum, this at first flat, later somewhat depressed, white, 1 mm. long, the strophiole projecting conspicuously.

Peru: Dept. Cajamarca, on rocks near San Pablo, 2200 to 2400 meters alt., April, 1904, *Weberbauer* 3846 (B-Holotype); Dept. Cajamarca, between Chota and Hualgayoc in stony places in the grass steppes, 3500 to 3600 meters alt., *Weberbauer* 4222 (B); grown from seed of plants collected in December, 1940, in Dept. Huancabamba, near Sondor, by H. Blossfeld, *University of California Botanical Garden* 53,486 (UC, US).

The *Weberbauer* material was presumably destroyed during the bombing of Berlin-Dahlem during World War II. There may be isotypes in Lima, Peru, either at the University of San Marcos or in the *Weberbauer* collections at La Molina, but these were not found in either herbarium by Hutchison in 1952. *Werdermann*<sup>8</sup> has published photographs of both *Weberbauer* collections.

Johnson<sup>9</sup> reported that in 1948 he found this species growing in a nursery in Lima and that he flowered it in Paramount, California. He also reported that during his Peruvian trip of 1951 he found, 4 km. from the town of Cajamarca, globular solitary cacti up to 10 inches high and, not far from San Miguel near Cajamarca, "a new species or variety of the Cajamarca plant" with fewer spines, broader and rounder ribs, the plants being discoid or up to 10 inches tall. He considered all of these to be close to *B. aurantiacus*.

We have not been able to study the Johnson plants, but assuming that these are *B. aurantiacus*, the presently known range of the species

<sup>7</sup>Capitalized colors are from the R. H. S. Horticultural Color Chart.

<sup>8</sup>*Werdermann*, E., *Kakteenk.* 5: 76-77, 1939.

<sup>9</sup>Johnson, H., *Cact. & Succ. Journ. Amer.* 25: 80-81, 1953.

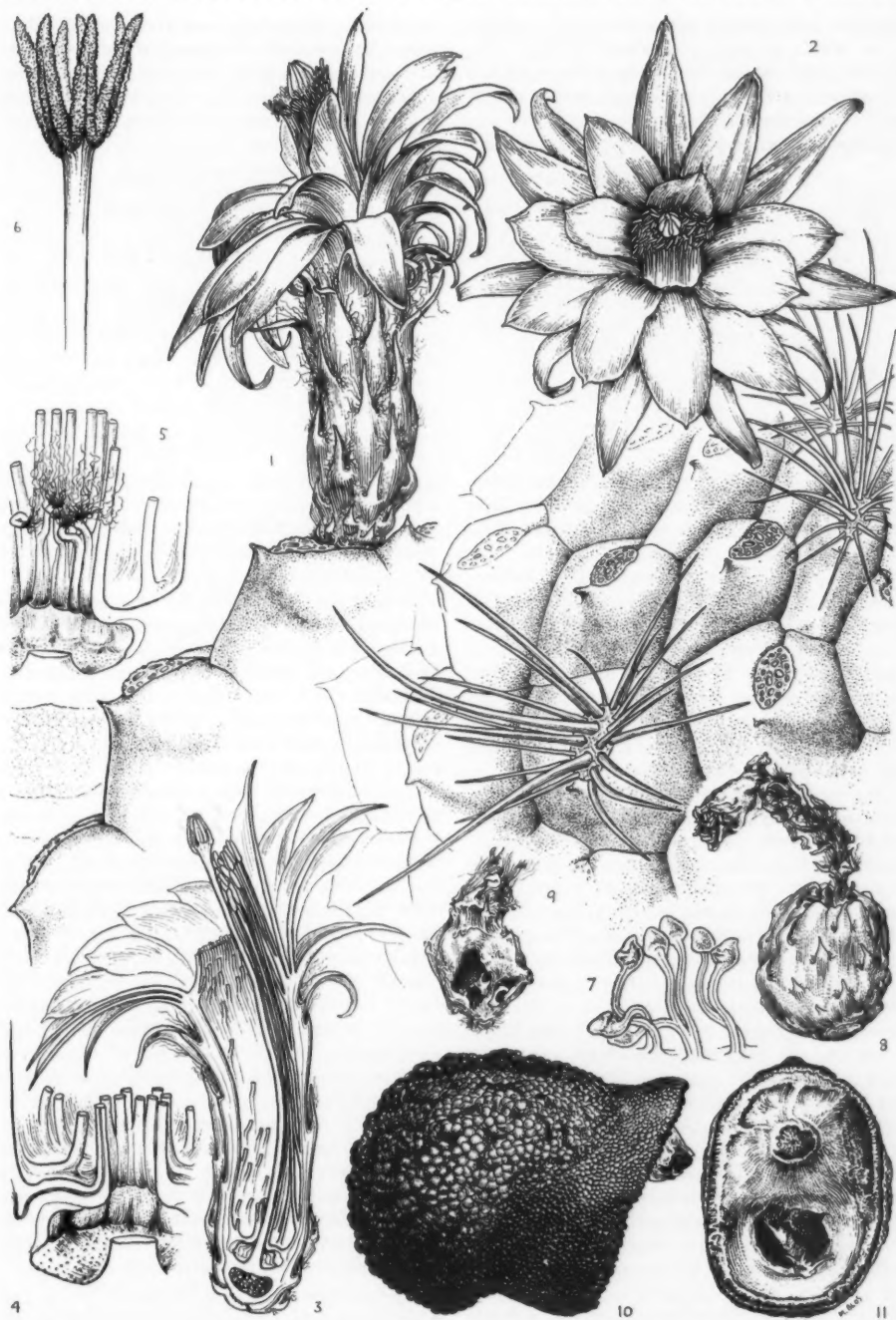


FIG. 31

*Borzicactus aurantiacus* (Vaupel) Kimn. & Hutchis., U. C. B. G. 53.486. 1. Podaria and flower, side view. 2. Flower, apical view. 3. Flower, longitudinal section, the stamens cut-off in one-half. 4. Nectary chamber. 5. Nectary chamber of another flower from same clone, showing staminodial hairs. 6. Stigma. 7. Funicles. 8. Ripe fruit before dehiscence. 9. Dehiscent and dried fruit. 10, 11. Seed. 1-3, 8, 9, natural size. 4, 5, x 4. 6, x 3. 7, greatly enlarged. 10, 11, x 20. Drawing by Mrs. M. Bloss, 1956



would be from Sondor in the north to Cajamarca in the south, a distance of about 200 km. The type locality is about midway between these two points. All of these localities are in the mountains west of the Rio Marañon.

When compared with the type description,

	Weberbauer 3846 (dried)	U.C.B.G. 53.486 (living)
Plant	6 cm. high, 7 cm. wide	14 cm. high, 15 cm. wide
Ribs	16, 1.5 cm. wide	16-17, 3 cm. wide
Areoles	8 mm. long, 5 mm. wide	12-15 mm. long, 4-7 mm. wide
Spines	25	20-30
radials	16, 1 cm. long	20-22, 1-2 cm. long
centrals	9, up to 5 cm. long	3-7, 4 cm. long
Tepals	6-7 mm. wide	10 mm. wide
Anthers	1.5 mm. long	2 mm. long
Stigma-lobes	3 mm. long	3-8 mm. long
Fruit	1 cm. wide	1.5 cm. wide
Seed	black when old	brownish black when fresh

The following are the published species which are most closely related to *B. aurantiacus*. They may not be specifically distinct, either from each other or from *B. aurantiacus*.

*Arequipa myriacantha* (Vaupel) Britt. & Rose, *Cactaceae* 3: 101, 1922; *Echinocactus myriacanthus* Vaup., *Bot. Jahrb.* 50, Beibl. 111: 25, 1913. This species differs, primarily, in having 26 as against 15 ribs, denser and more numerous spines, and a more hirsute, rose-colored flower. The type locality is "above Balsas," which is east of the Marañon and about 75 km. east of the type locality of *B. aurantiacus*.

*Matucana weberbaueri* (Vaupel) Backeb., *Beitr. z. Sukkulenteuk.* 1939: 42, 1939; *Echinocactus weberbaueri* Vaupel, *Bot. Jahrb.* 50, Beibl. 111: 26, 1913. This species has the same type locality as the preceding one and seems to be distinct from it mainly in its yellow flowers which are without receptacle hairs. Neither species is known to have been in cultivation.

Britton and Rose assigned their genera *Oroya*, *Denmoza*, *Matucana* and *Arequipa* to the tribe *Cereeae*, subtribe *Echinocactanae*, whereas *Borziacactus* and its columnar allies were placed by them in the subtribe *Cereanae*. Berger<sup>10</sup> accepted this disposition. Backeberg<sup>11</sup> included all of these genera, except *Oroya*, in his "Gren 5, *Loxanthocerei* Bckbg." (a *nom. nud.*), together with *Cleistocactus* Lem. and *Oreocereus* Ricc. All recent students of the family have agreed with Backeberg in associating with his "*Loxanthocerei*" those genera and a number of more recent segregates, including *Bolivicerens* Cárđ., *Clis-*

our plant of the Sondor race (U.C.B.G. 53.486) shows only minor deviations, all of which we attribute to phenotypic differences, shrinkage of the dried material, or the slight variations common among conspecific individuals.

*tanthocereus* Backeb., *Loxanthocereus* Backeb., *Seticereus* Backeb., *Morawetzia* Backeb., and *Maritimocereus* Akers & Buin. Buxbaum<sup>12</sup> suggests that *Oroya* should also be associated with this assemblage.

If the above genera can be considered monophyletic in origin, and we agree that they may be so considered, then *Oroya*, *Denmoza*, *Arequipa* and *Matucana*, which are globular or shortly-columnar (= echinocactoid), are derived from columnar (= cereoid) ancestors. Similar lines of reduction in stem-form are to be found elsewhere in the family, for example, in the line from *Trichocereus* to *Echinopsis* to *Lobivia*. *Echinocactus* Link & Otto, *sensu lato*, was a polyphyletic genus in which species were included primarily on the basis of their globular stem-form, just as *Cereus* Mill., *sensu lato*, applied merely to cacti with columnar stems. Britton and Rose, and later Berger<sup>13</sup>, divided these unnatural genera into a number of generic segregates containing closely related species. Their concepts of phyletic lines in the family were often incomplete or faulty, but their systems were more natural than any of those antecedent. More recently a number of authors, and notably Backeberg, have created many additional genera whose main function has been to define and separate small groups of species into natural units. However, segregating species into small, weakly differentiated genera is not the only way that phyletic lines can be demonstrated, and while we agree that most of the above-mentioned genera of the "*Loxanthocerei*" are natural, few of them seem to be necessary.

At present we feel that *Denmoza*, *Oroya*, and *Cleistocactus* should be accepted and that the remaining genera should be reduced under *Borziacactus* where some can be retained in sub-generic categories. A formal presentation of such an emended concept of *Borziacactus* is in preparation, and in it the necessary combinations will be

<sup>10</sup>Berger, A., *Die Entwicklungslinien der Kakteen*, 1926.

<sup>11</sup>Backeberg, C., in Backeberg & Knuth, *Kaktus-ABC*, 186, 1935.

<sup>12</sup>Buxbaum, F., *Sukkulenteukunde*, *Jahrb. d. Schweiz. Kakt.-Ges.* 3: 23, 1949.

<sup>13</sup>Berger, A., *Kakteen*, 1929.



made. In here transferring *Arequipa aurantiaca* to *Borzicactus*, we anticipate this eventual reduction of both *Arequipa* and *Matucana*.

Although *Arequipa* and *Matucana* appear to intergrade, there is some evidence that they are derived from two separate lines within the "Loxanthocerei". *Borzicactus aurantiacus*, *Arequipa myriacantha* (Vaupe) Britt. & Rose, *Matucana weberbaueri* (Vaupe) Backeb. and *Matucana baynei* (Otto) Britt. & Rose, seem more similar in floral, fruit and seed characters to those species of *Borzicactus* with a ring of hairs within the flowers (= *Borzicactus*, *sensu strictu*), such as *B. sepium* (HBK) Britt. & Rose, than they do to the type species of *Arequipa*, *Echinocactus leucotrichus* Phil. In *B. aurantiacus*, this hair-ring may not occur in some flowers of a single plant, or, when present, may not always form a complete ring. Usually, however, the entire innermost series of filaments next to the style is reduced to projections 1 mm. long, each terminating in a cluster of hairs. Therefore, in *B. aurantiacus* the hair-ring might be considered to be a phenotypically variable "relict-character," the occurrence and development of which may be influenced by cold or dry weather, for the hairs seem most numerous at the beginning of winter.

The groove extending above the areoles of *B. aurantiacus* does not occur in any other described species of the "Loxanthocerei" except *Borzicactus tessellatus* Akers & Buin. The flowers do not emerge from the groove and its origin and function are not clear, but probably it is merely a fold formed by the swelling of the podarium during growth. Backeberg has considered such grooves in South American cacti to be of great taxonomic significance and has founded the genera *Sulcorebutia* and *Brachycalycium* mainly on this character. However, we have observed similar grooves in two species of *Weingartia* Werd. (a genus recently reduced by Hutchison<sup>14</sup> to *Gymnocalycium* Pfeiff.) which are closely related to other *Weingartias* lacking the groove. While this character seems of dubious value as a sole generic criterion, it is a valuable specific one.

In both *B. aurantiacus* and *B. tessellatus* the podaria are almost identical in shape, being octagonal, with the areoles in the same position. Also, in both species there is a minute protuberance below the areole similar to those found in some forms of *Oroya* but not elsewhere in the "Loxanthocerei". This structure, which may be a rudimentary leaf-blade, is sometimes very conspicuous in some species of *Copiapoa* Britt. & Rose. The occurrence of this protuberance in two species of the "Loxanthocerei" that share additional similarities in podaria and staminal hairs,

and are geographically approximate, suggests close relationship.

Recent collections of cacti by F. Ritter and by Werner Rauh from the area in which these species occur may aid in clarifying their status and may increase our knowledge of natural variation in this assemblage.

In our experience, species of the "Loxanthocerei" are usually interfertile. The following crosses with our plant of *B. aurantiacus* (UCBG 53.486) have been made at this Botanical Garden, and immature seedlings of some are being grown.

*Arequipa leucotricha* (West 7142) ♂ x *B. aurantiacus*

*Arequipa leucotricha* (West 7142) x *B. aurantiacus* ♂

*Arequipa leucotricha* (Johnson 41) x *B. aurantiacus* ♂

*Borzicactus acanthurus* (Hutchison 529) x *B. aurantiacus* ♂

*Borzicactus aurantiacus* x *Matucana baynei* (Hutchison 567) ♂

*Borzicactus aurantiacus* ♂ x *B. morleyanus* (UCBG 49.2113)

*Borzicactus aurantiacus* x *Seticereus oehmeanus* (UCBG 53.961) ♂

In 1953 Robert Flores created an attractive hybrid which seems worthy of wide cultivation: *B. aurantiacus* x *B. icosagonus*. The two seedlings raised to maturity are nearly intermediate to their parents in body-shape and spination, being shortly columnar with rather dense golden spines; flowers and seeds are also intermediate. This hybrid begins flowering when young and so far there is no trace of the bristly floriferous stem-apex of *B. icosagonus*.

*Borzicactus aurantiacus* has considerable horticultural value and will doubtless prove popular with growers of cacti. Its fresh green color, dense spination and prominent podaria give the plant an attractive appearance resembling *Gymnocalycium saglionae* (Cels) Britt. & Rose. The flowers of the Blossfeld material, at least, are the largest and showiest in the "Loxanthocerei," the orange and crimson limb being prominent and widely expanded. Flowers tend to appear almost continually from spring to late summer, often by twos and threes, each lasting three or four days. Under identical cultural treatment *Matucana baynei* and *Arequipa leucotricha* have shorter flowering periods, which, however, may occur more than once a year.

Like most cacti from the Peruvian Andes, this species grows easily in central California, flowering best when grown outdoors as a grafted plant, with a near-freezing temperature during winter and rather cool summers. Our plant has undergone without damage several night-temperatures as low as 23°F.

<sup>14</sup>Hutchison, P. C., Cact. & Succ. Journ. Amer. 29: 11-14, 1957.

## *"Berkeley in '57"*

THE SEVENTH BIENNIAL CONVENTION OF THE CACTUS AND SUCCULENT SOCIETY OF AMERICA, INC.

Berkeley, California, July 12-16, 1957

NEWSLETTER No. 4—FEBRUARY, 1957

### HORTICULTURAL SYMPOSIUM

The panel for the Horticultural Symposium has now been selected: Harry Johnson, well-known nurseryman who has probably grown a greater variety of succulents than any one and who has collected many species in Latin America; Howard Gates, whose long experience with cacti, both in Mexico and at his nursery, makes him especially qualified; John E. C. Rodgers, author of the column "Cereusly Speaking" and representative of the well-rounded private collector; Al Irving, an expert grower and propagator of the "other" succulents, particularly those from Africa; and, as Moderator, Myron Kinnach, Assistant Manager of the U. C. Botanical Garden. During the evening of Sunday, July 14, these men will be seated around a table before you to discuss all the techniques and problems of growing succulents, as well as to answer your questions.

Among the subjects which will be exhaustively (but not exhaustingly) discussed, are: seed-sowing and care of seedlings, repotting, soil-mixtures, watering do's and don'ts, resting and growing periods, how to encourage flowering, glasshouse problems (including temperature, shade, construction, benches, etc.), grafting, pest control, labeling, hardiness, rock garden construction and planting, window-sill collections, frames, importing plants, landscaping hints, and any other subject that we or you can imagine. If you don't think we can cover all this thoroughly in one evening, just come and listen. Speakers will be concise, for the moderator plans to rudely interrupt them with a blow of his gavel (on the table) if they go over their time.

At certain times during the program the audience will be able to ask questions or present their problems for the panel members to solve—and if they cannot solve it perhaps someone else in the audience can. With all this combined knowledge on tap there should be no one, after the Convention, who has any problems at all—at least those concerned with growing succulents. And we can guarantee, at the very least, that if we can't help you we will at least sympathize with you. So be jotting down the troubles that vex and plague you, and, if they are not covered by the panel, be sure to speak up. Be sure, also, to bring along a notebook and pencil, for you will wish to copy down the names of materials, soil formulas, insecticides, etc., that may prove most helpful to you.

After the meeting is adjourned that evening, those who wish may stay to see a demonstration of grafting, starting with the basic technique and ending with the more specialized, and sometimes outlandish, procedures.

### WHAT TO WEAR

According to maps, the San Francisco area is located in California, but there are periods during summer when the weather closely resembles that of some more northerly clime. Our Golden Gate and the surrounding low hills may be picturesque but they are not very efficient barriers to the cold, clammy fogs which sometimes blanket our coast. The result is that if you come to this convention dressed in the way you attended previous ones you may find yourself experiencing weather that

would chill the enthusiasm of the most fanatic cactophile. Unless you wish to make emergency purchases locally, you would be wise to bring a hat and warm coat, or the equivalent. But we hasten to add that the more traditional weather of California will probably prevail—cloudless skies and sparkling sunshine.

### HOTEL, MEAL AND BUS RATES

The Hotel Shattuck has reserved 200 rooms and/or beds until June 20. Available are 20 singles at \$5, \$5.50 and \$6, 30 doubles at \$7, \$7.50 and \$9, and 30 twins at \$7.50, \$8 and \$9; additional beds for the doubles and twins are \$1.50 each. Suites are from \$15 to \$25. In case there are not enough rooms for everyone at this hotel, arrangements have been made for additional lodging at the Hotel Durant.

Special rates for group meals in the Convention Hall at the Hotel Shattuck are, Luncheon, \$1.35, Dinner, \$3, and for the concluding banquet, \$3.50; these prices are adjusted to include tips. Breakfast will be served only in the hotel dining room and the time, menu and price will be chosen by the individual. For the other meals menus can be changed, by arrangement and without extra charge, for those on special diets. The banquet will be held on the last evening and will consist of a steak dinner "with all the trimmings." Our Chairman has sampled the food at this hotel and pronounces it excellent.

On Monday, July 15, several reserved busses will take us on an all-morning tour of the Bay Area and, that afternoon, to the Botanical Garden. For this tour there will be a charge of \$3 per person, including children. We highly recommend this outing as a chance to see some fine scenery and as a refreshing change from our more formal programs.

### TALKS

Harry Johnson will show many of the slides taken by him on his 1951 expedition to Peru (see his travelogues in the 1952-1953 Journals). You can't afford to miss these wonderful glimpses of a cactus flora that recently has so enriched our collections.

Paul Hutchison will present "Portraits of South African Succulents," consisting of colored slides taken by such famous plant explorers as Harry Hall and H. Herre. Many of the very plants shown were sent to the Botanical Garden, where you will be able to examine them more closely.

Dr. George Lindsay, Director of the Natural History Museum of San Diego, will present a colored motion picture of the Sefton-Stanford expedition to Lower California. This should be a highpoint of the Convention, as it was shown to the local society several years ago and was unanimously considered to be a perfect blend of human interest, beautiful scenery and natural history. You will find the subject of collecting cacti on the small islands in the Gulf of California a fascinating one.

In contrast to the usual slide-lecture devoted to one subject, we intend that one program will consist of slides from many sources. To this end we request anyone having up to five slides, which he thinks of suffi-

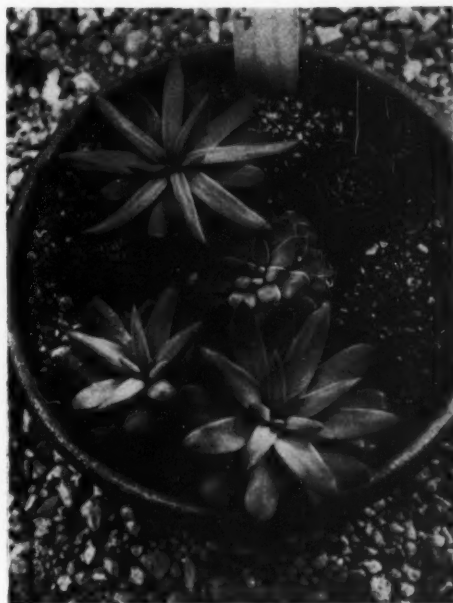


FIG. 32. (Left) *Orostachys japonicus* (Maxim.) Berg., showing different plants in varied growth phases, ca. 0.8x. FIG. 33. (Right) *Crassula columnaris* Thunb., ca. 0.6x. Photos P. C. Hutchison

cient quality, to send them at once, for final selection, to Paul Hutchison, 3017 Wheeler St., Berkeley, Calif. These will be returned to the owners after the showing. In choosing your slides consider what would most interest your audience, as well as color, design, and clearness. Subjects can be varied, including single plants or flowers, garden plantings, habitat shots, etc. Slides should be labeled with your name and that of the plant. We think this will prove an entertaining program.

#### UC BOTANICAL GARDEN

During the afternoon of Monday, July 15, there will be a tour of the Botanical Garden of the University of California, in Berkeley. This is the largest and most varied collection in central California and we refer you again to those Journal articles concerning it (July-August, 1953, and July-August, 1955). Here are plants that can be seen nowhere else in this country, and many are new introductions destined to be among our most popular plants. Now is your chance to see these before they become distributed.

#### ART CONTEST

While earlier we had announced this contest to be competitive, it is now felt that it should be held on a non-competitive basis. We hope this will not limit in any way the quantity and quality of those photos, drawings and paintings that will be on display. Let's all support this feature so that it can be repeated during future conventions.

#### DONATIONS

Donations for the auction and drawings continue to arrive. The Henry Shaw Cactus Society of St. Louis, Mo., has given a complete bound set of their "Cactus Digest", which contains an amazing amount of valuable plant information, and an autographed copy of Lad Cutak's recently published "Cactus Guide". Paul Hutchison has given a complete set (numbers I to V) of "Sukkulantenkunde", the German-language yearbook of the Swiss Cactus Society, which contains useful

photos and lists. From J. R. Brown we have received 5 copies of his book, "Unusual Plants", while Scott Haselton has contributed 2 sets of White and Sloan's "Stapelieae" and 2 sets of their "Euphorbieae", 5 copies of "Brazil and its Columnar Cacti", and 1 copy each of "Cacti for the Amateur" and "Succulents for the Amateur". These generous contributions will do much to make this and future conventions a success, for all auction profits go to the permanent Convention Fund of the national society. All amateurs and commercial dealers are urged to send the undersigned a list of anything they can contribute to this good cause, whether plants, seeds, books or gadgets.

Several hundred plants have been donated from various sources, for the auction and drawings. A partial list will give some idea of their rarity and quality:

Dwarf succulents, ideal for small pots: *Crassula marniereana*, *C. humilis*, *C. namaquensis*, *C. arta*, *C. columella*, *C. bottenotta*, *C. deceptrix*, *C. ausiensis*, *Monanthes polyphylla*, *M. brachycaulon*, *M. muralis*, *M. pallens* var. *silensis*, *M. subcrassicaulis*, *M. nipho-phila* (delicate clump-forming species rarely seen), *Anacampteros ustulata*, *A. lanigera*, *A. albissima*, *A. papyracea*, *A. crinita*, *Kalanchoe pumila*, *K. suarazensis*, *K. eriophylla*, *K. millotii* (beautiful in flower or foliage, these are the gems among Kalanchoes), *Graptopetalum filiferum*, *G. rusbyi*, *Sedum hintonii*, *S. caducum*, *Adromischus leucophyllus*, *A. bicolor*, *A. blosianus*, *A. rodinii*, *A. ballii*, *A. berrei*, *A. trigynus*, *A. umbraticolus*, *A. tricolor*, *Astroloba aspera*, *A. berrei*, *A. dodsoniana*, *Orostachys iwawange*, *O. aggregatus*, *Agave parviflora*.

Large-growing cacti: *Epiphyllum chrysocardium*, *E. lepidocarpum*, *E. grandilobum*, *E. thomsonianum*, *E. costaricense*, *E. cartagense* (large-flowered species hardly known to cultivation), *Cleistocactus candelilla*, *C. luri-bayensis*, *C. tarijensis*, *C. impizensis*, *C. jojoi*, *C. herzogianus*, *C. angusturensis*, *C. stransii* var. *fricii*, *Bolivi-*

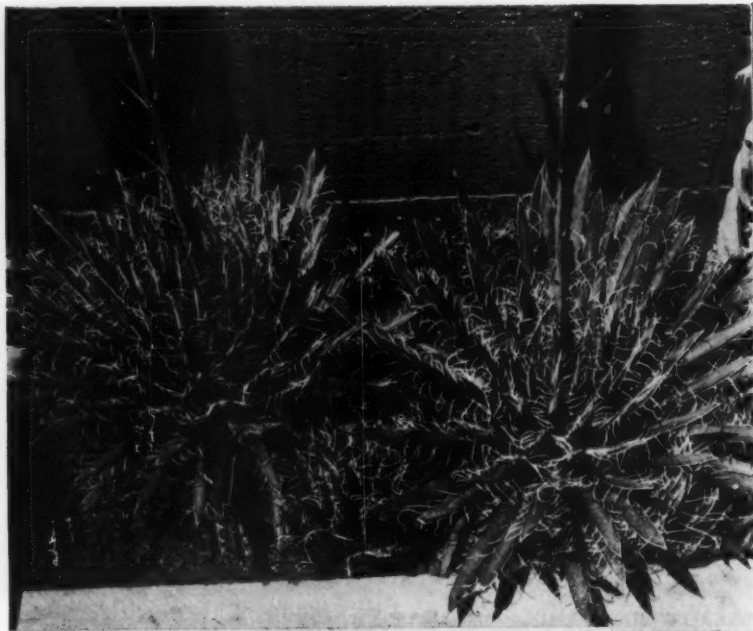


FIG. 33. *Agave parviflora* Torr. ca. x 0.25. One of the most attractive dwarf Agaves; this species is widespread in Californian collections. Photo P. C. Hutchison

*cerens samaipatanus*, *Castellanosia caineana*, *Neocardenasia herzogianus*, *Eulychnia acida*, *E. castanea*, *E. iquiquensis*, *Trichocereus poco*, *T. litoralis*, *T. chilensis*, *Arthrocerus microsphaericus*.

Globular cacti: *Toumeyia papyracantha*, *Neoporteria taltalensis*, *N. jussieu*, *N. occulta*, *N. napina*, *N. atrispinosa*, *N. kesselringiana*, *Parodia comarapana*, *P. schwebsiana*, *Copiapoa humilis*, *C. cinerea*, *Gymnocalcium westii*, *Neowerdermannia vorwerki*, *Melocactus matanzanus*, *Rebutia steinbachii*, *R. spinosissima*.

Oddities: *Bowiea kilimandscharo* (Lily Family), *Xerosicyos perrieri* (Gourd Family), *Alluaudia pro-*

*cera* (Didiera Family), *Monadenium stapelioides* (Euphorbia Family).

#### RESERVATIONS

In conclusion we urge everyone planning to attend the Convention to send in their reservations just as soon as possible. Failure to do so will not only result in confusing our committee, who must know the number that will attend, but may also detract from your own enjoyment of the Convention. Reservation forms will be mailed about April 1.

June 20th is the final deadline for reservations.

## FROM INDIANA

I will start out by saying that I don't know the best way to grow cacti in Indiana, where I happen to live, but what I can do is to relate to you the process of development that has led me to the system that I use now.

The summer of 1951 was the first year that my collection was out of the window sill. My Dad had some work tables with two shelves on them and each was about three feet square. I used two tables and put them on the east end of our front porch. This was better for the plants than having them in the house for they received more air. However, at the most, all the sun they would get would be in the morning. The plants were here for probably two summers until I had the brain storm of putting them in the back yard with their pots sunken into the ground.

There is a fence across the back of our lot and there was a space about three or four feet wide just in front of it that was not being used for anything (except by the weeds). So, I decided to put my cactus there. I had

to fill in a little with some of our native soil but the next summer my plants were in this spot.

With this arrangement, I ran into a little trouble with soil. I use a soil that comes from a place in the local park where leaves are dumped. I usually add some lime but I don't know how much good it does yet. I mix this soil either two to one sand or one to one. After having my plants in pots in our native soil for one summer, there was about a quarter of an inch of it washed by rain into them on top of my mixed soil. Our soil here is mostly clay so that did not help things any.

My next brain storm and development in my method was to dig out the native soil and replace it with the same soil that I had used in my pots. Then if it was washed into the pots, it would not make any difference. So, a project was started. If I was going to go to all this trouble, I might just as well make an actual "cactus bed" out of it. So, I decided I would bring it out six feet from the fence, make it three feet wide, as long as the back yard, and eighteen inches

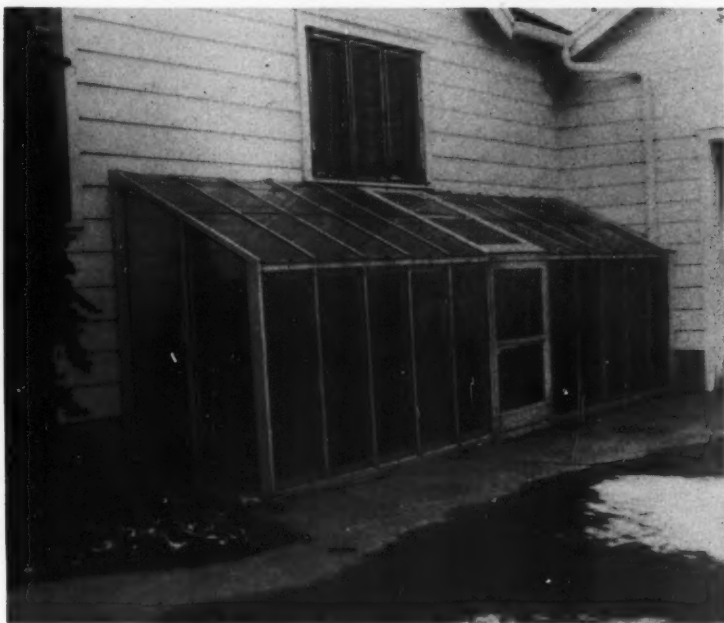


FIG. 34. Winter quarters are 17 ft. by 3 ft.

deep. Well, this was quite a project for spare time with all the digging, hauling in and mixing of dirt. It was begun at the east end. This bed was eighteen inches deep by four feet, twelve for the next six feet, and four inches deep for the next eight or ten feet. As the year got later and the work got harder, the depth got less.

I bought a collection of 100 assorted plants and planted them without pots in the deeper part of the mixed soil. They did wonderfully. The rest of the space was used for potted plants.

Problems came and my method developed farther. The bed did not drain well. This was true more so in the four inch section which I had covered with burlap for tender plants. What was my next development? I decided to use sand in place of soil in my cactus bed. The bed was extended to its full length with a last section twelve inches deep with sand. About that time I was informed that I was not to take soil from the park, so I gradually started using the soil in the four and twelve inch dirt section for potting. It was now a good thing that I had hauled all that dirt. However, it took the eighteen inch dirt section to fill in the four and twelve inch sections to where they should be and in turn, the eighteen inch section was filled with sand. At this time, the whole bed is sand and twelve inches deep, except the twelve inch soil section which is planted in Indiana *Opuntia compressa*.

Now for a word about the advantages of the sand and keeping cactus plants with their pots sunk in it. The sand, as I have stated, drains well and does not seem to be any wetter after a long rain than a short one. As soon as a drop of water hits it, it soaks in. Anyone who lives in Florida knows how rain acts on the sand there, or any sand.

Having the pots of the plants sunken keeps the roots evenly moist and cool. To water my plants, I just water the sand between the pots, except the large ones, and

it will soak into the soil of the pots. When the sand about the pots is moist, even on the hottest of days, the pots and roots of the plants are surprisingly cool.

While the summer method was changing, so was the winter. At first, my plants were kept on shelves near basement windows and in various window sills. However, two winter ago, my collection became too large for this. So I rented some space in a local greenhouse. The next summer we built a greenhouse on the east side of the house. The greenhouse is seventeen feet long and covers the three foot area between the house and the cement driveway on which it sets. It is under the kitchen window which makes it six feet tall at the highest point. It has two shelves half its length. With these measurements, anyone who is not as young (19) and as aware of spines as I am, has trouble getting around in this greenhouse.

Knowing their winter and summer quarters, it is not hard for one to figure my culture. My plants are not watered much in the summer as in Indiana we have enough rain during many of the months. However, our late summers are usually dry, with no rain. I water my plants with a spray every third night after the sun is down. Actually, I guess in the morning, before the sun is up would be better, but I am more apt to see the sun go down than come up! Watering in the winter is done but once a month.

These are my basic methods as they stand now. There are many details which I have not mentioned and also many which I have not solved. I am having too much root bug; I need to feed my plants; before too many years, I will have to find a new soil source, and many other things. As with most of us, my method is still developing. I don't know the best way to grow cacti in Indiana. Is there a "best way?"

ROY VAIL  
Richmond, Ind.





FIG. 35. *Haworthia kraussii* Hort. nat. size.

## Notes on *Haworthias*

By J. R. BROWN

*Haworthia kraussii* Hort.

In the last issue of this Journal (XXIX. 1957. 23) when writing of *Haworthia coarctata* var.

*kraussii* Resende, reference was made to an "old time" *Haworthia* which was named *Haworthia kraussii* Hort. This plant was listed by such old

German firms as Haage & Schmidt, Richard Graessner, etc., and I obtained it from Germany over 30 years ago. It was probably widely distributed at that time and it or a very similar plant was fairly common in wholesale nurseries in So. California, as it was very prolific, easy to grow, and a very satisfactory little plant for dish gardens.

While it may not be of great botanical interest the name may be confusing and would cause it to be worthwhile illustrating at this time. Small off-sets may be quite turgid on the leaf faces but older plants in a more or less dormant state have deeply channelled leaf faces. This *Haworthia* is quite evidently one of the numerous hybrids of *Haworthia tortuosa*.

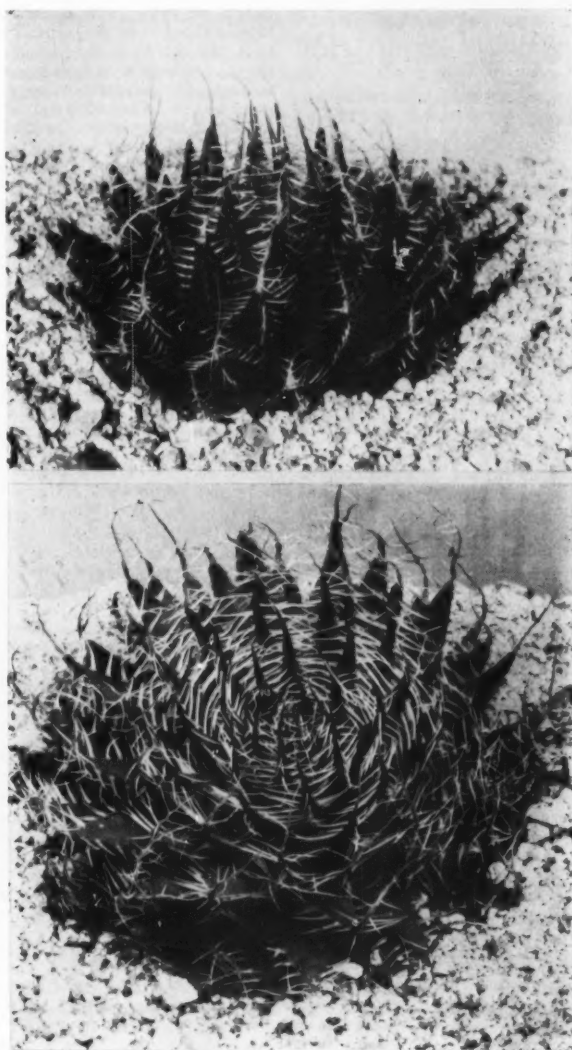


FIG. 36  
*Haworthia setata* var. *nigricans* Haw. nat. size. (Top) side view of rosette.  
(Bottom) rosette viewed from above.

*Haworthia setata* var. *nigricans* Haw. Revis. (1821) 56; Bak. in Journ. Linn. Soc. XVIII (1880) 216, in Th. Dyer, Fl. Cap. VI (1896) 354; Berger in Pflanzenr. IV. 38 (1908) 112; Poelln. in Repert. Sp. Nov. XLIV (1938) 224. *Aloe setosa* var. *nigricans* Roem. & Schult. Syst. veg. VII (1829) 641; Kunth, Enum. IV (1843) 513.

This var. of *Haw. setata* (sect. *Arachnoideae* Haw.) differs from the type by the blackish-green color of the leaves and the longer and more numerous white cilia-like teeth on the leaf margins.

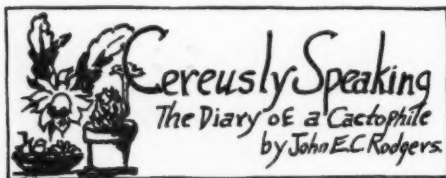
The color of the leaves resembles that of *Haw. setata* var. *gigas* Poelln. but the leaves of var. *gigas* are longer and are always more or less erect and incurved and is a taller plant.

Locality: unknown.

Introduced to England about 1818.

When well grown var. *nigricans* is very attractive, the expanded rosette showing a fine contrast of long slender white pellucid teeth against the black-green leaves.

The illustrations show 2 views of this *Haworthia* taken at different seasons of the year.



Five years ago I hybridized a late blooming *Schlumbergera russelliana* x *Zygocactus truncatus* (Christmas Cactus with *Schlumbergera gartneri* (Easter Cactus)). One fruit set on the Christmas Cactus which had five viable seeds. Three germinated but only two survived the seedling stage. Both are growing rapidly (third year); one has pendant stems which lay on the soil, as they grow longer the tips turn up. The center stems develop a triangular joint out of which the normal (but non-toothed) joint with spiny serrations like side hairs develop. The other one is upright and develops four-sided joints out of which the oval stems grow.

The color of both is a rich dark green with a waxy finish. The cotyledons were cerei-like and persisted. The small spine tuft resembled the columnar types in the early stage. Mr. Verschingle of the Montreal Botanical Gardens had many seedlings which followed the same pattern.

The only thing I can say is that I am more convinced than ever that the "Christmas Cactus" I have is the true *Schlumbergera russelliana* because neither seedling has any *Zygocactus* characteristics but follows a *Schlumbergera* hybrid pattern.

Most of us have grown *Schlumbergeras*, *Zygocactus* and hybrids from cuttings. At present I have many varieties ranging from near white (pink), through purple, orange and red. The stems vary as much as the blooms. I have a Christmas Cactus that throws out a five inch stem which has spine tufts up and down both sides but very few if any serrations. This same type of growth also appears on my *Nopal-*

*occhia*, *Epiphyllum Deutsche Kaiserin*, etc. The stems seldom branch but when they do it is at the ends of the long stems and they become slightly angled.

A mutual friend in Oberlin, brought a post graduate student, Miss Rebecca Snell, Uduvtl Chunnagain, Ceylon, to see my collection of cacti and other succulents. She had a small collection in her dormitory window in Oberlin. She recognized *Vitus quadrangularis* as an old friend and told me it grows wild in Ceylon and forms long vines which are cut for food. The stalks are eaten either cooked or raw. I had first read about it in Van Laren's "Succulents," Abbey San Encino Press, 1935, Page 7. In 1955, I saw a specimen plant, three joints high in Mrs. Elizabeth Eckstein's greenhouse in Denver, Colo. In the botanical greenhouse in Washington, D. C., I saw it as a rampant vine in 1954, (here I secured a five sectioned cutting which I rooted) and in the New York Botanical Garden in 1955 where the plant had been trimmed back to about thirty 10-inch stubs. Miss Snell told me that it grew luxuriantly in the warmth and moisture laden air of Ceylon. So far I have not sampled mine as it is a slow grower for me (undoubtedly it is due to my dry house and dry soil culture). Perhaps we will soon read in our Journal that it has been on the Cactophiles' menu as a snack.

A party of six Indonesian newspaper men came to Lorain this October while on a tour of the United States and I spent an hour and a half with two of them. Henk Rondonuw and Atje Bostoman were interested in the Xerophytes. I gave Mr. Rondonuw seeds of *Echinopsis rhodotricha*, *Echinocactus grusonii*, *Echinocereus rigidissimus*, *Lobivia huasba*, two varieties of *Ferocactus wislizeni*, and mixed *Gasteria* seeds. He had seen succulents in parts of Indonesia, used much as Florida used them, and wanted to "try his hand at it." Mr. Bostoman was familiar with succulent collections. Again cactus has opened the door to international friendship for me as it has done many times before.

Our seasons have been disarranged this year with snow, sleet and low temperatures during the spring. Summer had a deficiency of 273° and an excess of rainfall of 11.53 inches. Now we are having hot weather with no rain and glorious fall coloration in our trees and shrubs. Almost everything in the succulent line that I own did well in spite of the excesses. Coolness usually makes the colors finer and the growth firmer.

*Hylocereus lemairei* soaked up water from a suspended coffee can and lost its brown hard-shelled-edge look. It also put out five foot long shoots of healthy green. The *Rhipsalis*, soaked for so long, were suddenly dried out after September 6 and acted accordingly, budded and some have bloomed at least two or three months ahead of schedule and unless we have a sudden change, which I do not look for, my plants will be out until November 1st. I have my weather information for the fall of 1928 and this year is a duplicate. That was the year that flowers bloomed in December. There has been no killing frost in my backyard but a block or so away there was. My tender annuals are still doing fine.

My *Opuntia compressa* (hardy in most states) bloomed although it stood in water from mid-March to mid-June. It grows best in full sun but I have it also growing in semi-shade where pads elongate and it blooms less profusely.

My *Aporocactus* (*flagelliformis*, *flagriformis*, *marini* and *mallisonii* hybrid) have sent out new growth during the last six weeks. Water is not the sole answer I find. They also need good direct sunlight part of the day. They delight in a well lighted spot during the winter but not too near the glass as they burn easily at the base of the stems while dormant.

My obituary column must contain this notice. Died

April 1956, *Ariocarpus trigonus*, (single stem) aged 24 years. This single stem put up a gallant fight although it never developed any new top growth, it did have two bulbous roots which kept its natural gray-green. In 1950 it began to turn brownish at the tip, this gradually worked downward until its demise in 1956. Tenacity to life and adverse conditions has long been known for the cactus family but I think my *Ariocarpus trigonus* section did prove it for me.

My *Monvilleas* have bloomed this year. I find they take coaxing such as more room, richer soil, better light and plenty of water during their growing season. Within the last two years I have repotted most of the larger types. *M. cavendishi* with a tendency to scurf over at the tips, does bloom over a long period. I've kept it branching within three feet of the root system which is much better than the original plant of the late Dr. Henry Shetrone, Columbus, Ohio. It grew as a "vine" over a large area. Mine bloomed first in early June and is still setting buds which should open in mid-November if the light and heat stay good. *M. spegazzinii* (*C. marmoratus* Weber) blooms on triangular blue-green stems. It sets from one to three buds at an areole which open over an extended period of time. *M. phatnosperma* blooms every year on its pale-green, turning brownish near the base and older growth. The flower has brownish green outer petals and wider white inner petals. *M. diffusa* also has a white flower as do *M. insularis*, *M. rhodoleucantha* and *M. anisistii*. The literature I've found claim yellow tints as well as pink for some of these but I've seen only white with slightly darker outer perianth segments bordering on pink and yellow. *Monvilleas* are easy to grow either in a greenhouse or outside in summer and in the basement (cool) during the winter. The flowers persist even after flowering. They often drop off at the top of the ovary, leaving it, if unfertilized, to fall off later. There is no exact point of similarity outside of the flower, as each one looks similar to an *Eriocereus* or a *Harrisia*. They prefer plenty of leafmold, which in my case is made from Maple, Box Alder and Willow leaves. Frequent pottings seem to be the key to success in the small greenhouse where the plants can not be set in beds for rampant growth.

Well, I've heard sunspots blamed for almost everything this year, so I was not surprised to receive a letter asking me for my opinion about them. Can only say that 1929 was a good year for cactus, the same as 1957 is going to be.

My cultural hints should include the notes about *Epiphyllanthus obovatus* with Opuntia-like stems and purple flowers (near to *Zygocactus truncatus* and *Rhipsalidopsis rosea*). These plants whether coddled or neglected lost more and more of their new growth as well as the old. To save them I put a jar over them and built it up so that it lets air in freely from below but conserves moisture. They are growing fine and producing new growth rapidly. I have talked to other fanciers and they have had the same results as I did with the older method. Use those jars on some of those slow growers, it helps.

Those delightful little *Opuntias* that Harry Johnson lists from South America respond to plenty of moisture from below. I set the pots in tin containers and keep them moist during the growing season. They are doing better than ever. They take small pots but not small amounts of water. A liberal watering twice a week is my tip.

For those of you who find yourself with plenty of plants crowded in windows, I recommend one of those "bug bombs" that are so effective against the increase of progeny among the window dwellers. I used them to control mealy bugs, spine bugs, aphids, white fly, in my greenhouse or I also use one tablespoon of Mala-

thion to one gallon of water and it works wonders. Non-toxic to humans in the greenhouse, owners' opinions around here.

Well, happy window gardening to those of you who do and good cellar storage to those who have to, may your winter be blessed with good sturdy plants, when spring rolls around again in 1957.

JOHN E. C. RODGERS

#### SPOTLIGHT ON ROUND ROBINS

From International Robin, No. 2, Bernice Curnow in Australia has given her system of recording her many plants. She writes, "I keep a chart for plants. Each one is entered in a loose leaf book and numbered and then to a file card. I keep a loose leaf book to put down anything to do with each plant and have a separate one for Opuntias, Echinocereus and Mamms. I buy a diary having two days to a page and keep this in a plastic bag in an outside box, and each morning, or whenever I am at plants, which is every day as a rule, I put in the book which ones are flowering or have fresh off-sets. I have a weekly night to enter this into my loose leaf book. I have a huge roll-top desk and a lovely filing cabinet. Since I worked in an office for years, I like it nice and neat and everything labelled."

From C. & S. Robin No. 9, I took these notes. Nona Mott, from Arizona, wrote, "Yes, the Epiphyllums are taking over! Some have made trees and others runners six feet and longer. Cuttings of Epiphyllums must grow until of an age to produce a flower, and there will never be a flower on the slender stem-like growth, I found out. They seem to require a nicely aged, flat, wide, fat leaf or the angled ones; a larger diameter than usual and shorter in length. Maybe others could give you better advice but here are my reasons for bud drop in these or other succulents. The first and most likely is, at some time, a drastic change of temperature; second, letting them get too dry sometime during their full growing season; third, the turning or shifting the plants—it's the quickest and surest way to be rid of a nice fat bud."

In this same Robin Helen Arp, of New Jersey, says she has about 100 plants, and Roy Vail says he has about 550 "which I keep in a bed of sand in the summer and in a small greenhouse in the winter." Nona Mott says she has "some 500 plants now," but she adds, "At first I filled the window sills, then the coffee table, and even the chair arms. By then my family decided it was time to do something, for it was 'nip and tuck' whether I or my cacti went, or both. For safety's sake I bought a plant house, a small one 8'x10', but you would be surprised just what can be crowded into that space by hanging from the ceiling and pinning against the walls and spread around the floor." Shirley Shrader, in Ohio, remarked that "we all seem to have the same problem—what to do with all the plants when winter comes. I have just finished trying to cram all my collection into one attic window, the only window where they can enjoy cold, dry air and sunlight. We can never see out of any windows for I ended up by putting most of the specimen plants in the attic and all the seedlings on the window sills around the house. Even the bathroom window is always covered with plants! One fell into the bathtub when my father was taking a bath! He was awfully mad! Well, I was mad too!" (Hint to Mr. Schrader; better build a plant house for Shirley.)

What an enchanting word is "spring," when as I write the frigid arctic weather is upon us; snow blankets everything, and most plants are dormant. That is, all except my pretty *Echeveria* with its translucent orange lanterns which are so cheerful.

It is said the Roman calendar began in March, with

the spring of the year, and, no doubt, they made their New Year resolutions then as we do in January. May I suggest you make a resolution at this time? If you have not yet joined a Round Robin, what better time than now, in the spring, when there is much to talk about and plants are stirring. You will enjoy new friendships, and share a mutual hobby at the cost of just postage and a little time. Think of the pleasure it will bring you! Resolve to join right now and send me a card. Any member of the Cactus and Succulent Society of America is eligible for these Robins.

We welcome three new members this time. Mrs. Edna Lord, Rochdale, Lancs., England, who has just joined our Society; Mrs. J. B. Clark, Fort Worth, Texas, whose interest is in the Hardy Cactus Robin at present; Miss Esther Larson, San Francisco, California, who just discovered our Robins.

How about writing me what you would like to have for new Robins. Also on file there are a number of Robins but with one member each, so far. Among them the Epiphyllum, the Mammillaria, the City Dweller's and an International Robin. Any of these could be international in scope if overseas members wish to belong.

Several of the Robins are beginning to send leaflets, catalogs and other extra material too heavy for the Robin itself, in a separate round. It seems like an excellent idea. Succulents Only Robin and International Robin No. 1 are two which are doing so.

From the Robins come these notes gleaned from several. Ella Nipper, in the Succulents Only Robin, said, "In winter I allow the soil to become powder dry between waterings. Echeverias and Stapelias especially like this treatment, and in real cold weather I never water any of the succulents. It seems pretty drastic treatment, but for me it works best—even the Byrophyllum flowers are larger and colors brighter when kept on the dry side. Sedum morganianum, planted in sandy leaf mold, likes to be watered about every three weeks sparingly." Ella also had this to say about the propagation of the lovely Echeveria crenulata, "At first I could not get the leaves to start, but after I had the plant two years, I used the matured leaves only, planted on the top of dry sand. About one out of four grew. Keep them on the dry side until the roots are a half inch long, then I water very sparingly. They must have plenty of fresh air."

From Rose White, of the same Robin, come these remarks, "No one has mentioned the Crassula I consider the very best of them all as far as ease of growing and beauty of flower is concerned. That is *C. falcata* with its sickle-shaped leaves and large umbels of scarlet-red flowers, which will last a month at least. Even half a leaf will send up small plantlets if buried a slight ways in sand. It is hardy in San Rafael (California), apparently not at all bothered by rain or cold weather, so all of you would find it rather easy to grow. I have two varieties, one has much shorter, thicker leaves, and the flower head is not as large." One more note from her letter may help some member to succeed with *Crassula teres*. She says, "I finally succeeded in growing *C. teres* after nursing it along some five years or more. I did it by losing it in a corner of my greenhouse behind some other things, where it did not get full sun and probably practically no water for many months. When I finally ran into it, it was in the pink of condition so naturally I left it right where it was. They say you can spot it at once in a greenhouse if it blooms, by its fragrance." She also had an interesting

note and quote from Mr. Krejci on why some seeds take longer to germinate than others. Mr. Krejci wrote her, "Since the rains in desert countries are irregularly spaced, and of irregular quantity, the plant divides its seed so that some germinate during each rainy period, and in that way some are sure to survive."

Edith Bestard had so many interesting things to say that I despair of using them all, but one is from C. & S. Robin No. 1 in which she states, "I get many blossoms on my cacti since I started wintering them in unheated rooms. I have a northwest room which is practically all windows on the west . . . never light a stove in it. I get more blossoms from those so wintered than I do from ones I keep all winter in Dad's greenhouse, which must indicate something. The Peanut cactus especially responds to cool, dry wintering."

From International Robin No. 1, Roy Strangs in England has some thoughtful advice when he says, "You must expect some casualties. It can be expensive but you learn more by your losses than you do keeping plants healthy and bright. If I lose any plants that are difficult for me, I usually get another and another until I have conquered the cause for the loss." He added, "You will never get the cactus growing business licked. You can always learn something new no matter how long you have been tending them. That is what an old gardener told me once, and I think there is a lot in what he said."

For those of us who never see *Opuntias* growing in Texas, this description given by Billie Anderson is a little different, not to say amazing, as she sent a picture of a "cartwheel" *Opuntia*. She wrote, "This *Opuntia*, five feet or over, was started from a half grown pad four years ago. The pears on this plant are teacup size and a quarter pound in weight. Peel one and the juice is rich blood-red, leaves the hands stained and won't wash off. Makes beautiful red jelly and good. The fruits are sold in the market in old Mexico. The grown pads of this *Opuntia* are eighteen to twenty inches across."

Since the planting of seeds is one way to increase your supply of plants, here are a few excerpts from the Small Cacti & Mimicry Succulents Robin. Nona Mott says, "My seed pans are all in the house on the window sills. I evidently have no rhyme nor reason to my seed planting. I plant anytime I can make room for another pan. I have 36 different batches of babies up. Some kinds I'd never had before. They are all growing like weeds." Nona lives in Arizona. From Doreen Murphy, Edinburgh, Scotland, "I am purring like a tom-cat over my seedlings this year, have counted over 400 from 45 varieties. I much prefer vermiculite (for seeds) because it is sterile; if feeding is necessary use Bio or Buxbaum salts." From Roy Strange, England, "I grow a large number of plants from seed every year. This year I sowed about 200 packets from various sources." Lastly Bruce Cutler from New Zealand, "Have only 50 seed pans going so far. I sow my seed in a mixture of about equal parts grit, soil and leaf-mould but never seem to get the same mix twice in succession. I use the same stuff year after year with a little priming of new stuff. I dunk the pans in liquid manure (sheep) every few weeks to give the seedlings a good boost, and several times throughout the summer I spray with one of the foliar sprays."

All reports must have an ending, but Robins keep flying around. Write me if you wish to join one.

(MRS.) GLADYS H. PANIS

P. O. Box 705, Falmouth, Massachusetts



## NEWS FROM THE RESEARCH BOARD

The Slide Committee, under the direction of George G. Glade, 7600 Verdugo Crestline Drive, Tujunga, California is ready to handle any requests for slide sets which you may send in.

The Librarian, Mrs. Orva Bokarica, 1496 Cheviotdale Drive, Pasadena, California is ready to send to you any of the many fine books on cacti and the other succulents which are listed in the loan list of the Society's Library.

The Committee for identification of plants is ready and waiting to attempt determination of any species which may be sent in for that purpose. Send plants to the Research Board, 820 West 115th Street, Los Angeles 44, California.

And lastly, the Committee for new Plant Distribution has been busy preparing new plants for issue to

those members who wish to send in for them. These plants are now available to the members of the Society; you may have been able to obtain some of these species before but most of them are reasonably new to the American collector.

Please be sure to address your requests for plants to the Research Board, Homer G. Rush, Chairman, 820 West 115th Street, Los Angeles 44, California. And be sure to include 50¢ per plant for cost of the packaging and shipping and to include several alternate choices in case the plants you first choose are already gone. Limit is one of each species. The earliest requests are given first service so DO IT NOW!

THE RESEARCH BOARD: Homer G. Rush, *Chairman*; Dr. Robert Craig, Harry Johnson, Sr., Scott Haselton, Don B. Skinner

LIST OF THE PLANTS NOW BEING OFFERED  
TO MEMBERS

NO. OF PLANTS	NO.	SPECIES	SPECIES	NO. OF PLANTS	NO.
44	53.576	Crassula colae	5	55.323	Sedum griseum
4	51.820	Crassula radicans	7	55.939	Sedum tricarpum
3	53.569	Crassula abyssinica	18	52.240	Sedum rupifragum
2	55.709	Crassula obvallata	15	56.020	Sedum alfredi var. nagasakianum
1	53.1180	Crassula platyphylla	3	55.116	Sedum ambiflorum
1	49.1944	Crassula congesta	6	52.1673	Sedum cockerellii
1	49.1949	Crassula purcellii	5	55.896	Sedum taquetii
30	C 347	Crassula species	40	54.170	Villadia batesii
6	56.332	Orostachys japonicum #1	22	51.306	Sinocrassula indicum var. yunnanense
23	55.124	Orostachys japonicum #2	10	55.313	Aichrysum bethencourtianum
4	54.1423	Orostachys japonicum #3	16	50.1256	Peperomia japonicus
15	52.1764	Orostachys fimbriatum	3	51.885	Aeonium balsamiferum
5	54.1418	Orostachys malacophyllus	12	54.363	Aeonium spatulatum var. cruentum
42	LAP. 142	Kalanchoe Sp. #9151 Kenya.	1	54.1304	Aeonium ciliatum
5	LAP. 125	Kalanchoe nyikae	2	54.380	Aeonium rubrolineatum
7	LAP. 148	Kalanchoe laxiflora	5	51.890	Aeonium castello-paivae
5	LAP. 31	Kalanchoe petersi	1	51.891	Aeonium virgineum
10	LAP. 7	Kalanchoe petitiiana	1	51.895	Aeonium spatulatum
6	LAP. 249	Kalanchoe streptantha	10	51.888	Aeonium decorum
8	54.1448	Kalanchoe millotii	7	51.898	Aeonium caespitosum
28	K. 109	Kalanchoe tomentosa	5	54.389	Aeonium lanceroetense
23	LAP. 36	Kalanchoe pubescens	3	A 771	Aloe castanea
8	LAP. 31	Kalanchoe gastonis-bonnieri	8	A 774	Aloe rivae
6	52.1075	Kalanchoe dawei	4	B 8382	Aloe sp. Bally.
9	101	Kalanchoe prolifera	2	32.1082	Epiphyllum pittierii
15	0000	Cotyledon barbeyi	5	56.564	Epiphyllum strictum
2	53.483	Echeveria paniculata	4	53.528	Epiphyllum caudatum
8	53.524	Echeveria pringlei	2	52.1074	Hylocereus stenopteris
12	ER. 107	Echeveria alba	4	52.1085	Hylocereus calcaratus
6	ER. 209	Echeveria columbaria	6	52.953	Cryptocereus anthonyanus
6	ER. 228	Echeveria sp.	6	52.1083	Werckleocereus imitans
1	ER. 239	Echeveria aristata	4	52.1079	Werckleocereus tonduzii
1	52.1875	Echeveria simulans	8	54.308-2	Adromischus caryophyllaceus
9	ER. 601	Echeveria sprucei × rosei Hyb.	7	52.1723	Adromischus hemisphaericus
13	6601	Graptopetalum macdougalii	16	14.337	Adromischus clavifolius
20	55.743	Sedum japonicum	11	53.968	Adromischus saxicolus
14	SR. 407	Sedum caducum	10	53.1234	Adromischus umbraticola
20	54.1417	Sedum oryzifolium	6	51.575	Adromischus roeanus
4	SR. 401	Sedum chontilense	6	54.005	Adromischus trigynus
21	55.096	Sedum pulvinatum	31	49.1650	Monanthes muralis #1
10	55.723	Sedum yezoense	18	51.336	Monanthes muralis #2
21	SR. 138	Sedum glabrum	22	16.543	Monanthes polyphylla
21	51.1355	Sedum cupressoides	16	16.543	Monanthes anagensis
8	52.1679	Sedum harvardii	15	51.904	Monanthes brachycaulon
10	53.407	Sedum wrightii			

## QUESTIONS and ANSWERS

Conducted by  
**HARRY JOHNSON**  
Paramount, Calif.



*Question:* Can you tell me what to do for a Night Blooming Cereus that has little brown spots on the leaves that look like little burned holes? It is the type Cereus that has no thorns. The spots have just started in the past two months and are getting worse. Would Red Arrow or Volck spray help?

MRS. ED DIXON, Cal.

*Answer:* The brown spots on your Night Blooming Cactus will probably not be helped by spraying. The plant is probably the Queen Cactus (*Epiphyllum oxypetalum*) and not a *Selenicereus* or *Hylocereus* which are more commonly called Night Blooming Cereus. The trouble is probably caused by a virus though as far as I know no scientist has as yet worked out the true cause. However we do know that certain conditions under which a plant is growing tend to increase the frequency with which the condition appears. A poor circulation of air, lack of light and some humidity seem to be often associated with it. During the night the plants transpire and the stems become cold. As the air temperatures rise in the early morning moisture is condensed on the stems as it will on a cold window-pane. I have long thought this is where the trouble gains a foothold. Plants growing in too much shade are susceptible to spot as are those that are growing in a close atmosphere. Again plants growing in drafty places are often unsightly from spot. The best preventive is to place the plants where there is a good circulation of air, an abundance of light, though not necessarily full sunlight and to make sure the roots are in good healthy condition. When new healthy growth appears the old deformed stems can be removed. The running down of the cause of the trouble might make the subject for a thesis by some post-graduate student.

*Question:* My Lithops are doing fine. Three of them have put out four leaves instead of two. Is that natural or due to overwatering?

JOHN SODERBERG, Indiana

*Answer:* Each growth should have but a single pair of leaves at a time. Too much water will cause the new pair of leaves produced each year to become turgid and split the old pair apart and then emerge, thus four leaves are produced. However this is always due to too much water.

The new pair must absorb the old pair of leaves to exactly fill the space the old pair filled. In nature the plants are buried in the ground almost to the tops of the growths which is the reason for its odd manner of growth. In cultivation, if they were buried, water would promptly rot them so they are generally grown above the soil level. Their growing period is from September to April or May varying with culture. During the summer they like to rest. I rest them in a very light but not too sunny a place. They don't need too much heat at any time.

*Question:* I have a row of native *Opuntias* in my garden and they were doing well up to last August when I noticed the pads turning gray and drying up. Today I dug one up and found nematodes and galls on the roots. What would you suggest? Isn't there some chemical I can pour around the roots?

WM. H. DAVIS, Texas

*Answer:* I doubt the nematodes worked so swiftly on your outdoor plants. They generally take a long time to kill a plant and do it by starving a plant to death, which in a cactus is not very suddenly. My guess is your plants have a bad infestation of cactus scale which would turn the pads gray and cause them to dry up. Scale can increase very fast if conditions are right. Scrape the surface with a knife or stick. If the scurf comes off it is surely scale. You have a choice of sprays but either Volck, which is an oil emulsion spray, or Malathion will prove effective. Remember to spray them thoroughly three times two or three weeks apart so you will be sure to kill all the eggs and all the smart or lucky fellows who evaded the first spraying. If the nematodes are really to blame I would suggest you do not waste your time trying to kill them. Your plants are in an outdoor bed and hence nematodes would be extremely difficult to completely eradicate with chemicals no matter what the labels on the cans promise. There is an easier and far more practical way to go about rehabilitating your plants. Cacti have an almost incredible power to "come back" though they may look beyond recall to the uninitiated observer. If your row of *Opuntias* were well top-dressed with cow or stable manure and then well soaked, in a few weeks you would see an appreciable difference. The "leaves" would plump up and new growth appear. In a few months, if they were soaked every time they were dry, they would be as good as ever. Generally nematodes do their dirtiest work when plants are starved and too dry. When growth is stimulated, new feeding roots are formed and the plants have a chance to outgrow the pest. Plants that have lost all their roots should be treated differently for the nematode galls furnish

a storehouse of young worms which quickly kill off any new roots formed. The roots should be cut off to the fresh base of the plant which should

then be treated as a cutting by drying for a month and then carefully rerooting. The plant will then be completely free of nematodes.



## SPINE CHATS

LADISLAV CUTAK



It is nice to learn that my "Cactus Guide" is being so well received, especially in English-speaking sections of the world. I have gained a number of new foreign correspondents, as well as domestic ones, through the publication of this book by Van Nostrand in March of 1956. What surprises me most is that there are still many people who practice the cactus hobby without the slightest idea that there are cactus clubs to which they could belong. I was most amazed that they didn't even hear of the Cactus and Succulent Society of America! When I first contemplated "Cactus Guide", I felt that a chapter on existing cactus clubs was a necessity and it has proven correct. There is a desire by many of my correspondents to join clubs. In order that my files on cactus clubs be kept up-to-date I am asking each club or society, especially the new ones organized since the publication of my book, to furnish me with pertinent information such as I use in "Cactus Guide". Write to me in care of the Missouri Botanical Garden, St. Louis 10, Missouri.

G. W. Reynolds describes three new species and one new variety of *Aloe* from the Karamoja region in northern Uganda in the July 1956 issue of the Journal of South African Botany. This famous *Aloe* specialist covered more than 900 miles in Karamoja where he noted *Aloe tweediae* to be the commonest *Aloe* of that country. It however is not one of the three new species described. The three new species are *Aloe amudatensis*, *A. wilsonii* and *A. wrefordii*. The new variety is *A. schweinfurthii* var. *labworana*.

*Aloe amudatensis* differs from its nearest East African allies in the Section *Saponariae* by being a smaller plant, and in having narrow leaves only 5-6 cm. broad with white cartilaginous margins armed with small firm almost white teeth. Plants are stemless, sucker freely and form small to large dense groups. A natural hybrid with *A. tweediae* was also observed.

*Aloe wilsonii* is a very distinctive species and does not appear to be closely allied to any species of *Aloe* hitherto described. A striking character is the very acuminate racemes that taper to an acute point. Plants occur on rocky slopes up to 8,000 feet above sea level and usually are solitary, acaulescent, or sometimes develop a decumbent smooth stem 50-80 cm. long.

*Aloe wrefordii* occurs as solitary plants, with little or no stem, and has a tall many-branched inflorescence bearing capitate racemes of cylindric-clavate scarlet or orange flowers. Up to the present it has been found only on lower foothills of Mount Moroto.

*Aloe schweinfurthii* var. *labworana* is named after the locality, Labwor Hills, which appears to be its headquarters. The new variety closely resembles typical *A. schweinfurthii* in habit of growth, leaves and markings, but differs in having comparatively longer leaves with larger marginal teeth, and a more branched inflorescence with shorter denser racemes of yellow flowers.

*Aloe perrieri* is a new name proposed by Reynolds for Perrier's *Aloe parvula* since the latter was mistaken in his concept of *Aloe parvula* Berger. This new-named *Aloe* is characterized by having leaves 30 cm. long and a simple inflorescence less than twice the length of the leaves. The plant is native to Madagascar, where another close relative, *Aloe bellatula*, is now recognized as a new species by Reynolds. *A. bellatula* is characterized by having leaves only 10-13 cm. long, and a very slender inflorescence about five times larger than the leaves. The discourse on "The identity of *Aloe parvula* Berger, with a new synonym, a new name, and a new species from Madagascar" also appears in the July 1956 number of Journal of South African Botany (pp. 129-134).

The Joshua Tree, *Yucca brevifolia*, is an anomaly of the southwestern deserts. Efforts of the white man to find practical uses for yucca products have not been definitely successful. Studies of roots as sources of soap solutions have been found neither sufficient stocks for continuous supply nor any practical program of replacement. Use of yucca wood for paper making would threaten destruction of the forests and consequent evils of erosion. Leaf fibers offer some possibilities for use but questions of economic value and danger from tree defoliation arise. The Joshua Tree flowers offer a crop that could be harvested with ease without danger to the tree itself or to the maintenance of the forest cover. Flower stalks and flowers were tested in experimental cookery for palatability and flavor, largely with negative results. It appears from the experiments once conducted by Messrs. Woodbury, Noall, Kinney and Sugihara that the flowers of the Joshua Tree are edible but not particularly desirable as food. The flower petals when raw are tender and succulent and have a rather interesting flavor and aroma, but they leave a peculiar bitter, astringent taste in the mouth, which persists for some time after eating them. The flowers are quickly cooked. The bitter taste still persists and a somewhat slippery, soapy flavor and texture is developed. When boiled in water containing bicarbonate of soda, the flowers lose some of their soapy and bitter taste, but they become so "mushy" and slimy that the texture is very undesirable. Vinegar added to the cooking water preserves a desirable texture, but does not improve the flavor.

The four gentlemen who made the experiments during the war years believed that with the present state of knowledge Joshua Tree flowers could not be recommended to the market as a food item, but that a further look into the matter deserved attention.

The giant ground-sloths, *Northrotherium*, which roamed the desert valleys and coastal plains in southern California during the Pleistocene Age, made use of the yuccas as food. In fact, the other name for the *Northrotherium* is "Yucca-feeding Sloth."

## Cadereyta dos Montes, Gro., Mexico

**Apartado 347**      **San Luis Potosi**      **S.L.P. Mexico**

**2514 Hillside Ave., Norco, Calif.**

**1135 Waverly Place, Schenectady 8, N. Y.**

The third issue of "Cactaceas y Suculentas Mexicanas" has been received. In this issue is a new species *Nopalea esculentensis* by Prof. Eizi Matuda. Other contributors were Dudley B. Gold, H. Sanchez Mejorada, Dr. Helia Bravo, and Dr. Jorge Meyran. There are many fine illustrations including *Tillandsia recurvata* growing on telephone wires; this is the *Tillandsia* which George Olin has collected in Arizona. You should send \$2.00 to Dudley B. Gold, Aniceto Ortega 1055, Mexico 12, DF., and receive all issues to date.

